

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 19,0 n5  
 Edition : 12.01.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 640 114  
 Injection pump  
 Pump designation : PE12A95D610LS2590  
 EP type number : 0 410 690 995  
 Governor  
 Governor design. : RQV300...1150AB1086-  
 1L  
 Governor no. : 0 420 212 221  
 Customer-spec. information  
 Customer : KHD  
 Engine : F12L413F  
 1st version kW : 247.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 247 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 1.50...1.60  
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-  
 11- 10- 3- 6- 7- 12  
 Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1130  
 Rack travel in mm : 9.90...10.00  
 Del. quantity cm<sup>3</sup>/ : 8.4...8.6  
 100 s: (8.2...8.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 600.0  
 Rack travel in mm : ?  
 Del. quantity cm<sup>3</sup>/ : 1.2...1.8  
 100 s: (0.9...2.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 600  
 travel mm : 1.40...1.50  
 2nd speed rpm : 615  
 travel mm : 1.70...1.90  
 3rd speed rpm : 665  
 travel mm : 2.80...3.00  
 4th speed rpm : 1180  
 travel mm : 8.50...8.60  
 5th speed rpm : 1225  
 travel mm : 9.30...9.40

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1165  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1130

Del. quantity : 84.0...86.0  
1000 : (82.0...88.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 8.90  
Speed rpm : 1170...1180  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 83...91

#### Testing:

Speed rpm : 300  
Minimum rack travel: 10.50  
Speed rpm : 600  
Rack travel in mm : 5.90...6.10

#### CONSTANT REGULATION

Speed rpm : 600...670

#### TORQUE CONTROL

Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1130  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 800  
Rack travel in m: 10.80...10.90  
3rd speed rpm : 945  
Rack travel in m: 10.60...10.70  
4th speed rpm : 1030  
Rack travel in m: 10.10...10.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 90.5...93.5  
1000 s: (88.0...96.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.90  
Speed rpm : 1170...1180

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

#### APPLICATION

Compressor

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 p8  
 Edition : 19.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 648 118  
 Injection pump  
 Pump designation : PE8A95D410LS2608  
 EP type number : 0 410 698 988  
 Governor  
 Governor design. : RQV750AB1041L  
 Governor no. : 0 420 212 109

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 117.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

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Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 720

Rack travel in mm : 10.60...10.70

Del.quantity cm<sup>3</sup>/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.3...1.9

100 s: (1.0...2.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 720

Del.quantity : 97.0...99.0

1000 : (95.0...101.0)

Spread cm<sup>3</sup> : 3.00

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 21...29

Testing:

1st rack travel in: 9.60

Speed rpm : 753...758

2nd rack travel in: 4.50

Speed rpm : 775...785

START CUT-OUT

Speed 1/min : 680 (700)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.60  
Speed rpm : 753...758

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 116.5...126.5  
1000 s: (113.5...129.5)

Remarks:

:

APPLICATION

Generator set

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 15,8 c3  
 Edition : 17.10.90  
 Replaces : 15.8.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 649 244  
 Injection pump  
 Pump designation : PE10A95D610/4LS2452  
 EP type number : 0 410 699 998  
 Governor  
 Governor design. : RQV300...1100AB1055-1L  
 Governor no. : 0 420 212 215

Customer-spec. information  
 Customer : KHD

Engine : F10L413F

1st version kW : 198.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

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Rack travel in mm : 9.00...12.00  
 Firing order : 1-10- 9- 4- 3- 6-  
 5- 8- 7- 2

Phasing : 0-27-72-99-144-171-  
 216-243-288-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 9.60...9.70

Del.quantity cm<sup>3</sup>/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350

travel mm : 0.70...1.20

2nd speed rpm : 395

travel mm : 1.50...2.00

3rd speed rpm : 820

travel mm : 554.00...5.90

4th speed rpm : 1150

travel mm : 8.00...8.50

5th speed rpm : 1450

travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 8.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 57...65

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 450...500

TORQUE CONTROL  
Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 750  
Rack travel in m: 10.50...10.60  
3rd speed rpm : 910  
Rack travel in m: 10.30...10.50  
4th speed rpm : 1000  
Rack travel in m: 9.80...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 95.5...98.5  
1000 s: (93.0...101.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.60  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 13.50...14.20

Remarks:

#### APPLICATION

Wheel loader



Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.50

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 310...370  
Speed rpm : 700  
Maximum rack trave: 1.00

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1325  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 500  
Rack travel in m: 10.00...10.10

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.70  
Speed rpm : 1365...1375

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 116.5...127.5  
1000 s: (113.5...130.5)  
Rack travel in mm : 14.00...14.40

#### HIGH IDLE

1st version  
Rack travel in mm : 3.90...4.10  
Spread cm<sup>3</sup> : 10.00  
1000 s: (-)

Remarks:  
:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 5,7 e 3  
 Edition : 19.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 280  
 Injection pump  
 Pump designation : PES6A80D410RS2085Z  
 EP type number : 0 410 886 043  
 Governor  
 Governor design. : RQV300...1475AB532DL  
 Governor no. : 0 420 214 056

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 352

1st version kW : 74.0  
 Rated speed : 2950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1450  
 Rack travel in mm : 7.90...8.00  
 Del.quantity cm<sup>3</sup>/ : 4.3...4.4  
 100 s: (4.1...4.5)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

2nd speed rpm : 300.0  
 Rack travel in mm : 7.5...7.7  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 1495  
 travel mm : 8.50...8.60  
 2nd speed rpm : 950  
 travel mm : 5.00...5.30  
 3rd speed rpm : 750  
 travel mm : 3.90...4.40  
 4th speed rpm : 550  
 travel mm : 2.70...3.00  
 5th speed rpm : 300  
 travel mm : 0.70...1.20

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1495  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1450  
 Del.quantity : 43.0...44.0  
 1000 : (41.5...45.5)  
 Spread cm<sup>3</sup> : 2.00  
 1000 : (3.50)

**RATED SPEED**

1st version  
Control lever  
position degrees: 99...117

Testing:  
1st rack travel in: 6.90  
Speed rpm : 1505...1515  
2nd rack travel in: 4.00  
Speed rpm : 1560...1590  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 7.50...7.70

CONSTANT REGULATION  
Speed rpm : 430...540

TORQUE CONTROL  
Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 1450  
Rack travel in m: 7.90...8.00  
2nd speed rpm : 500  
Rack travel in m: 9.10...9.20  
3rd speed rpm : 770  
Rack travel in m: 8.80...9.00  
4th speed rpm : 1000  
Rack travel in m: 8.10...8.40

START CUT-OUT  
Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 6.90  
Speed rpm : 1505...1515

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 71.0...81.0  
1000 s: (68.0...84.0)  
Rack travel in mm : 12.90...13.30

Remarks:

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# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 p 2  
Edition : 31.08.90  
Replaces : 19.3.90  
Test oil : ISO-4113

Combination no. : 0 400 846 538

Injection pump  
Pump designation : PES6A95D32ORS2693  
EP type number : 0 410 896 914  
Governor  
Governor design. : RQ300/1300AB1204R  
Governor no. : 0 420 201 640

Customer-spec. information  
Customer : DAF

Engine : DNT 620

1st version kW : 130.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 7.6...7.7

100 s: (7.4...8.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 800

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 76.5...77.5

1000 : (74.5...79.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.70  
Speed rpm : 1350...1365  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

Testing:

Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 540...580

TORQUE CONTROL

Dimension a mm : 0.55  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.60...10.80  
2nd speed rpm : 850  
Rack travel in m: 12.00...12.40  
3rd speed rpm : 935  
Rack travel in m: 11.30...11.70  
4th speed rpm : 1080  
Rack travel in m: 10.80...11.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 250  
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 1290  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (71.5...78.5)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 65.5...66.5  
1000 s: (63.5...68.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1350...1365

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...145.0  
1000 s: (127.0...148.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF 6,2 p 5  
 Edition : 28.09.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 586  
 Injection pump  
 Pump designation : PES6A95D32ORS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RQ300/1300AB1254R  
 Governor no. : 0 420 201 651

Customer-spec. information  
 Customer : DAF

Engine : NT 119

1st version kw : 119.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00x1.50x600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 850

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Del.quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 850

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.30  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.1

Testing:

Speed rpm : 200  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 500...540

TORQUE CONTROL

Dimension a mm : 0.32  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 850  
Rack travel in m: 11.10...11.40  
3rd speed rpm : 975  
Rack travel in m: 10.70...11.00  
4th speed rpm : 1025  
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1290  
Del.quantity cm3/ : 68.0...70.0  
1000 s: (65.5...72.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1340...1350

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

APPLICATION

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MMM 4,1 b 3  
 Edition : 05.11.90  
 Replaces : 31.8.90  
 Test oil : ISO-4113

Combination no. : 0 400 864 079

Injection pump  
 Pump designation : PES4A90D320/3RS2659  
 EP type number : 0 410 894 028  
 Governor  
 Governor design. : RSV325...1175AOC2247  
 -1R

Governer no. : 0 420 233 271

Customer-spec. information  
 Customer : MMM

Engine : TD224/ 4

1st version kW : 72.0  
 Rated speed : 2350

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...0.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

**BASIC SETTING**

1st speed rpm : 1175

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 8.0...8.1

100 s: (7.8...8.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.0...7.2  
 Del.quantity cm<sup>3</sup>/ : 0.8...1.4  
 100 s: (0.6...1.6)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1175  
 Aneroid pressure h: 700  
 Del.quantity : 80.5...81.5  
 1000 : (78.5...83.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 93...101

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1215...1225  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
3rd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1430  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 500  
Rack travel in m: 11.70...11.80  
4th speed rpm : 920  
Rack travel in m: 11.20...11.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 230  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 81.0...83.0  
1000 s: (78.5...85.5)  
Aneroid pressure h: 230  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 72.5...74.5  
1000 s: (70.0...77.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 63.0...64.0  
1000 s: (61.0...66.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1215...1225

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks:

: RENAULT

#### APPLICATION

Tractor (tractor engines)



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 q 1  
 Edition : 05.11.90  
 Replaces : 28.9.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 375  
 Injection pump  
 Pump designation : PES6A95D32ORS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RSV300...1300AOC2251  
 R  
 Governor no. : 0 420 233 272

Customer-spec. information  
 Customer : DAF

Engine : NT 119

1st version kW : 119.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del. quantity cm<sup>3</sup>/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : ?

Del. quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del. quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 103...111

Testing:  
1st rack travel in: 9.30  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1385...1415  
3rd rack travel in: 4.00  
Speed rpm : 1410...1440  
4th rack travel in: 1570  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 300  
Rack travel in mm : 6.00...6.50  
Rack travel in mm : 2.00  
Speed rpm : 560...620

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 500  
Rack travel in m: 11.10...11.20  
4th speed rpm : 1050  
Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1290  
Del. quantity cm<sup>3</sup>/ : 68.0...70.0  
1000 s: (65.5...72.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 1340...1350

#### LOW IDLE

Speed rpm : 300  
Del. quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (4.5...13.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF 6,2 q 3  
 Edition : 05.11.90  
 Replaces : 14.9.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 378  
 Injection pump  
 Pump designation : PES6A95D32ORS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RSV300...1300AOC2248  
 -2R  
 Governor no. : 0 420 233 274

Customer-spec. information  
 Customer : DAF

Engine : NT 133

1st version kW : 133.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 7.6...7.7

100 s: (7.4...7.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.2  
 Del.quantity cm<sup>3</sup>/ : 0.7...1.1  
 100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.75

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 700  
 Del.quantity : 76.5...77.5  
 1000 : (74.5...79.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
3rd rack travel in: 4.00  
Speed rpm : 1410...1440  
4th rack travel in: 1570  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 300  
Rack travel in mm : 6.00...6.50  
Rack travel in mm : 2.00  
Speed rpm : 560...620

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 11.80...11.90  
4th speed rpm : 1070  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.50...11.60

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.70...10.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700

Speed rpm : 1290  
Del.quantity cm<sup>3</sup>/ : 73.0...75.0  
1000 s: (70.5...77.5)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 50.5...51.5  
1000 s: (48.5...53.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.50  
Speed rpm : 1340...1350

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 c 9  
 Edition : 16.08.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 380  
 Injection pump  
 Pump designation : PES6A90D41ORS2710  
 EP type number : 0 410 896 082  
 Governor  
 Governor design. : RSV350...1200A1C1163  
 L  
 Governor no. : 0 420 232 546

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 74.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1200  
 Rack travel in mm : 9.30...9.40  
 Del. quantity cm<sup>3</sup>/ : 5.1...5.2  
 100 s : (4.9...5.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.4)

2nd speed rpm : 370.0  
 Rack travel in mm : 7.9...8.5  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.2  
 100 s : (0.8...1.4)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Del. quantity : 51.0...52.0  
 1000 : (49.0...54.0)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (4.50)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 109...117

Testing:  
 1st rack travel in: 8.30  
 Speed rpm : 1240...1245  
 2nd rack travel in: 4.00  
 Speed rpm : 1267...1280  
 4th rack travel in: 1400

Speed rpm : 0.30...1.40

Unimog

LOW IDLE 1

Control lever

position degrees: -3

Setting point w/out bumper spring

Speed rpm : 370

Rack travel in mm : 8.2

Testing:

Speed rpm : 100

Minimum rack travel: 19.50

Speed rpm : 370

Rack travel in mm : 8.10...8.30

Rack travel in mm : 2.00

Speed rpm : 460...520

TORQUE CONTROL

Dimension a mm : 1.30

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 9.30...9.40

2nd speed rpm : 600

Rack travel in m: 10.00...10.20

3rd speed rpm : 900

Rack travel in m: 9.80...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 41.0...43.0

1000 s: (38.5...45.5)

Speed rpm : 900

Del.quantity cm<sup>3</sup>/ : 46.0...49.0

1000 s: (43.5...51.5)

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 85.0...95.0

1000 s: (82.0...98.0)

Rack travel in mm : 16.80...17.20

LOW IDLE

Speed rpm : 370

Rack travel in mm : 7.90...8.50

Del.quantity cm<sup>3</sup>/ : 10.0...12.0

1000 s: (8.0...14.0)

Spread cm<sup>3</sup> : 2.50

1000 s: (4.50)

Remarks:

:

APPLICATION

A22

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 20,9 s  
 Edition : 05.11.90  
 Replaces : 6.86  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 724  
 Injection pump  
 Pump designation : PE12P120A520/4LS3828  
 EP type number : 0 411 820 714  
 Governor  
 Governor design. : RQ250/1150PA739  
 Governor no. : 0 421 801 279

Customer-spec. information  
 Customer : MAN

Engine : D2842LE

1st version kW : 529.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30  
 : (4.15...4.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 1150  
 Rack travel in mm : 11.40...11.50  
 Del.quantity cm<sup>3</sup>/ : 19.5...19.7  
 100 s : (19.2...20.0)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s : (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 550  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 1000  
 Del.quantity : 195.0...197.0  
 1000 : (192.0...200.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 20.0

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1220...1235  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.30  
Speed rpm : 250  
Rack travel in mm : 6.70...6.90  
Rack travel in mm : 2.00  
Speed rpm : 315...355

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 750  
Rack travel in m: 11.40...11.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.00  
2nd pressure hPa : 300  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 520  
Rack travel in m: 10.70...11.00

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 200.0...206.0  
1000 s: (197.0...209.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1220...1235

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...7.00  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 2-7593



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 20,9 t  
 Edition : 05.11.90  
 Replaces : 7.86  
 Test oil : ISO-4113

Combination no. : 0 401 840 725

Injection pump  
 Pump designation : PE12P120A520/4LS3828  
 EP type number : 0 411 820 714  
 Governor  
 Governor design. : RQV250...1150PA668-7  
 Governor no. : 0 421 813 481

Customer-spec. information  
 Customer : MAN

Engine : D2842LE

1st version kW : 560.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30  
 : (4.15...4.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 1150

---

Rack travel in mm : 11.90...12.00

---

Del.quantity cm<sup>3</sup>/ : 20.0...20.2  
 100 s: (19.7...20.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.9...7.1  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 2.00...2.50

2nd speed rpm : 900  
 travel mm : 6.70...6.90

3rd speed rpm : 1150  
 travel mm : 8.50...8.60

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1

Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1150  
 Del.quantity : 200.0...202.0  
 1000 : (197.0...205.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

Ship

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

#### Testing:

1st rack travel in: 10.90  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1335...1365  
4th rack travel in: 14.50  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 250  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 400...460

#### START CUT-OUT

Speed 1/min : 200 (220)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.90...7.10  
Del. quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 2-7590

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 10,0 o6  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 745  
 Injection pump  
 Pump designation : PE6P110A32ORS3080  
 EP type number : 0 411 816 722  
 Governor  
 Governor design. : RQV250...1100PA919  
 Governor no. : 0 421 813 776

Customer-spec. information  
 Customer : VOLVO

Engine : TD 100 G

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...174  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X-600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 12.30...12.40  
 Del. quantity cm<sup>3</sup>/ : 16.7...16.9  
 100 s: (16.4...17.2)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 250.0  
 Rack travel in mm : 3.9...4.1  
 Del. quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (1.2...2.1)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.20...1.30  
 2nd speed rpm : 370  
 travel mm : 2.60...3.00  
 3rd speed rpm : 430  
 travel mm : 3.50...3.90  
 4th speed rpm : 1160  
 travel mm : 8.10...8.30  
 5th speed rpm : 1210  
 travel mm : 9.40...9.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1180  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del. quantity : 167.0...169.0  
 1000 : (164.0...172.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

**RATED SPEED**

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 5.30  
Speed rpm : 250  
Rack travel in mm : 3.90...4.10

CONSTANT REGULATION  
Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 610  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 280  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 121.0...124.0  
1000 s: (118.0...127.0)

#### BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...190.0  
1000 s: (156.0...196.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.90...4.10  
Del.quantity cm<sup>3</sup>/ : 15.0...19.0  
1000 s: (12.5...21.5)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

#### Remarks:

:  
Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 11,0 x  
 Edition : 05.11.90  
 Replaces : 2.2.90  
 Test oil : ISO-4113

Combination no. : 0 401 846 910

Injection pump  
 Pump designation : PE6P110A320LS3851  
 EP type number : 0 411 816 765  
 Governor  
 Governor design. : RQ300/1050PA187-26  
 Governor no. : 0 421 801 489

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 160.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 10.90...11.00

---

Del. quantity cm<sup>3</sup>/ : 12.2...12.4  
 100 s: (11.9...12.6)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.3)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.9  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.4)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.1)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 650  
 Rack travel in mm : 13.10...13.90

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1050  
 Del. quantity : 122.0...124.0  
 1000 : (119.5...126.5)

Spread cm<sup>3</sup> : 8.50  
 1000 : (13.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 650  
 Rack travel in mm : 13.5

Testing:

1st rack travel in: 9.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:

Speed rpm : 200  
Minimum rack trave: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 119.0...125.0  
1000 s: (119.0...125.0)  
Spread cm<sup>3</sup> : 11.00  
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 11,0 w  
 Edition : 05.11.90  
 Replaces : 12.4.90  
 Test oil : ISO-4113

Combination no. : 0 401 846 918

Injection pump  
 Pump designation : PE6P110A320LS3851  
 EP type number : 0 411 816 765  
 Governor  
 Governor design. : RQV300...1050PA884-6  
 Governor no. : 0 421 813 832

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 160.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 12.2...12.4

100 s: (11.9...12.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm<sup>3</sup> : 0.6

100 s: (1.1)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 440  
 travel mm : 2.70...3.20

3rd speed rpm : 730  
 travel mm : 4.70...5.20

4th speed rpm : 1110  
 travel mm : 8.00...8.50

5th speed rpm : 1360  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Del.quantity : 122.0...124.0  
1000 : (119.5...126.5)  
Spread cm<sup>3</sup> : 8.50  
1000 : (13.00)

Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 83...91

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 300...500

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 119.0...125.0  
1000 s: (119.0...125.0)  
Spread cm<sup>3</sup> : 11.00  
1000 s: (14.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 10,2 a  
 Edition : 19.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 935  
 Injection pump  
 Pump designation : PE6P120A320RS3262  
 EP type number : 0 411 826 797  
 Governor  
 Governor design. : RQV300..1050PA232-4  
 Governor no. : 0 421 813 883

Customer-spec. information  
 Customer : VME

Engine : TD102 GC

1st version kW : 180.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 9.20...9.30  
 Del.quantity cm3/ : 16.9...17.1  
 100 s: (16.6...17.4)  
 Spread cm3 : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm3/ : 3.2...3.7  
 100 s: (2.9...3.9)  
 Spread cm3 : 0.5  
 100 s: (0.7)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 300  
 travel mm : 1.30...1.70  
 2nd speed rpm : 500  
 travel mm : 2.70...3.30  
 3rd speed rpm : 800  
 travel mm : 4.90...5.50  
 4th speed rpm : 1100  
 travel mm : 7.60...7.70  
 5th speed rpm : 1180  
 travel mm : 8.80...9.20

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900

Del.quantity : 169.0...171.0  
1000 : (166.0...174.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 8.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.90  
Speed rpm : 300  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 9.20...9.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 160  
Rack travel in m: 9.10...9.20

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 164.0...166.0  
1000 s: (161.0...169.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 260.0...290.0  
1000 s: (256.0...294.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 32.0...37.0  
1000 s: (29.5...39.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

APPLICATION

Loading machine

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 L 2  
Edition : 05.11.90  
Replaces : 12.4.90  
Test oil : ISO-4113  
  
Combination no. : 0 401 848 805  
  
Injection pump  
Pump designation : PE8P110A320LS3846-1  
EP type number : 0 411 818 719  
Governor  
Governor design. : RQ300/1050PA187-27  
Governor no. : 0 421 801 488

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 195.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
                  : (4.35...4.55)  
Rack travel in mm : 9.00...12.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del. quantity cm<sup>3</sup>/ : 11.1...11.3

100 s: (10.8...11.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.3)

2nd speed rpm : 300.0  
Rack travel in mm : 7.0...7.6  
Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.4)  
Spread cm<sup>3</sup> : 0.6  
100 s: (1.1)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 13.10...13.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Del. quantity : 111.0...113.0  
1000 : (108.5...115.5)  
Spread cm<sup>3</sup> : 8.50  
1000 : (13.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 650  
Rack travel in mm : 13.5

Testing:

1st rack travel in: 9.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

Testing:

Speed rpm : 200  
Minimum rack trave: 9.20  
Speed rpm : 300  
Rack travel in mm : 7.00...7.60  
Rack travel in mm : 2.00  
Speed rpm : 400...440

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 106.0...112.0  
1000 s: (103.5...114.5)  
Spread cm3 : 11.00  
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 l 3  
 Edition : 05.11.90  
 Replaces : 2.1.90  
 Test oil : ISO-4113

Combination no. : 0 401 848 806

Injection pump  
 Pump designation : PE8P110A320LS3846-1  
 EP type number : 0 411 818 719  
 Governor  
 Governor design. : RQ300/1050PA187-28  
 Governor no. : 0 421 801 492

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

---

Rack travel in mm : 10.90...11.00

---

Del.quantity cm<sup>3</sup>/ : 12.2...12.4  
 100 s : (11.9...12.6)

---

Spread cm<sup>3</sup> : 0.8  
 100 s : (1.3)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.9  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s : (1.3...2.4)

Spread cm<sup>3</sup> : 0.6  
 100 s : (1.1)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 650

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 122.0...124.0  
 1000 : (119.5...126.5)

Spread cm<sup>3</sup> : 8.50  
 1000 : (13.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 650  
 Rack travel in mm : 13.5

Testing:

1st rack travel in: 9.90  
Speed rpm : 1080...1090  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:

Speed rpm : 200  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 300  
Del.quantity cm<sup>3</sup>/ : 119.0...125.0  
1000 s: (119.0...125.0)  
Spread cm<sup>3</sup> : 11.00  
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 r  
 Edition : 05.11.90  
 Replaces : 20.7.90  
 Test oil : ISO-4113

Combination no. : 0 401 848 808

Injection pump  
 Pump designation : PE8P110A320LS3846-1  
 EP type number : 0 411 818 719  
 Governor  
 Governor design. : RQV300...1050PA884-5  
 Governor no. : 0 421 813 831

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 213.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del. quantity cm<sup>3</sup>/ : 12.2...12.4

100 s: (11.9...12.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.3)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.9  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm<sup>3</sup> : 0.6

100 s: (1.1)

(B) Setting of injection pump  
 with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 440  
 travel mm : 2.70...3.20

3rd speed rpm : 730  
 travel mm : 4.70...5.20

4th speed rpm : 1110  
 travel mm : 8.00...8.50

5th speed rpm : 1360  
 travel mm : 11.00...12.00

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Del.quantity : 122.0...124.0  
1000 : (119.5...126.5)  
Spread cm<sup>3</sup> : 8.50  
1000 : (13.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 9.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 85...93

#### Testing:

Speed rpm : 200  
Minimum rack trave: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.30...6.90

#### CONSTANT REGULATION

Speed rpm : 300...500

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 119.0...125.0  
1000 s: (119.0...125.0)  
Spread cm<sup>3</sup> : 11.00  
1000 s: (14.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 r 1  
 Edition : 05.11.90  
 Replaces : 19.6.90  
 Test oil : ISO-4113

Combination no. : 0 401 848 810

Injection pump  
 Pump designation : PE8P110A320LS3846-1  
 EP type number : 0 411 818 719  
 Governor  
 Governor design. : RQV300...1050PA884-7  
 Governor no. : 0 421 813 859

### Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 195.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del. quantity cm<sup>3</sup>/ : 11.1...11.3

100 s: (10.8...11.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm<sup>3</sup> : 0.6

100 s: (1.1)

(B) Setting of injection pump  
 with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.40

2nd speed rpm : 480  
 travel mm : 3.10...3.60

3rd speed rpm : 770  
 travel mm : 5.60...6.10

4th speed rpm : 1100  
 travel mm : 8.70...9.20

5th speed rpm : 1310  
 travel mm : 11.00...12.00

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Del.quantity : 111.0...113.0  
1000 : (108.5...115.5)  
Spread cm3 : 8.50  
1000 : (13.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 25...93

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.90  
Speed rpm : 300  
Rack travel in mm : 7.00...7.60

CONSTANT REGULATION  
Speed rpm : 300...500

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm3/ : 106.0...112.0  
1000 s: (103.5...114.5)  
Spread cm3 : 11.00  
1000 s: (14.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 10,8 a2  
 Edition : 17.10.90  
 Replaces : 6.4.88  
 Test oil : ISO-4113

Combination no. : 0 401 876 334

Injection pump  
 Pump designation : PE6P120A32ORS468  
 EP type number : 0 411 826 128  
 Governor  
 Governor design. : RSUV300...900POA320  
 -1

Governer no. : 0 421 829 107

Customer-spec. information  
 Customer : MWM

Engine : D-TBD 234 V6

1st version kW : 300.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 3- 2- 5- 4

Phasing : 0-90-120-210-240-330

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 24.9...25.1

100 s: (24.6...25.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 249.0...251.0

1000 : (246.0...254.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control Lever

position degrees: 116...124

Testing:

1st rack travel in: 12.70

Speed rpm : 940...950

2nd rack travel in: 4.00  
Speed rpm : 965...995  
4th rack travel in: 1130  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.1  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 320...380

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 450  
Rack travel in m: 13.70...13.80  
3rd speed rpm : 280  
Rack travel in m: 14.90...15.50

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 940...950

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 c1  
 Edition : 05.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 876 776  
 Injection pump  
 Pump designation : PE6P12DA32ORS3206-2  
 EP type number : 0 411 826 784  
 Governor  
 Governor design. : RSV250...900P4A374-10  
 Governor no. : 0 421 833 345

Customer-spec. information  
 Customer : VOLVO-TRUCK

Engine : T1D 121 LP

1st version kW : 295.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.00...12.10  
 Del. quantity cm<sup>3</sup>/ : 29.8...30.0  
 100 s: (29.5...30.3)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 2.3...2.9  
 100 s: (2.0...3.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.40

Governor spring pre-tension  
 Click setting x : 3.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1500  
 Del. quantity : 298.0...300.0  
 1000 : (295.0...303.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 98...106

Testing:  
1st rack travel in: 11.00  
Speed rpm : 945...955  
2nd rack travel in: 4.00  
Speed rpm : 970...1000  
3rd rack travel in: 4.00  
Speed rpm : 985...1015  
4th rack travel in: 1150  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 48...56  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 4.9  
Speed rpm : 250  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 12.00...12.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.10...7.30  
2nd pressure hPa : 1000  
Rack travel in m: 11.50...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 135.5...137.5  
1000 s: (132.5...140.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 945...955

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 265.0...295.0  
1000 s: (261.0...299.0)  
Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 12,2 b3  
Edition : 05.11.90  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 401 876 777  
  
Injection pump  
Pump designation : PE6P120A320RS3261  
EP type number : 0 411 826 796  
Governor  
Governor design. : RSV250...1100POA374-11  
Governor no. : 0 421 833 346  
  
Customer-spec. information  
Customer : PENTA  
  
Engine : TAMD 102

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 019  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8  
  
Test Lines : 1 680 750 067  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 3.50...3.60  
                  : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900  

---

Rack travel in mm : 12.20...12.30  

---

Del. quantity cm<sup>3</sup>/ : 25.8...26.0  
100 s: (25.5...26.3)  

---

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 250.0  
Rack travel in mm : ?  
Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
100 s: (1.7...2.9)  
Spread cm<sup>3</sup> : 0.5  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.40

Governor spring pre-tension  
Click setting x : 2.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1500  
Del. quantity : 258.0...260.0  
1000 : (255.0...263.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1120...1130

2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 41...49  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 4.7  
Speed rpm : 250  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 390...450

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 12.20...12.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.60...8.80  
2nd pressure hPa : 270  
Rack travel in m: 9.00...9.10  
3rd pressure hPa : 1000  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 900  
Del. quantity cm<sup>3</sup>/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1120...1130

#### STARTING FUEL DELIVERY

Speed rpm : 100

B20

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.10...5.30

#### Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

#### APPLICATION

Navy



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,1 a  
 Edition : 17.10.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 401 876 779

Injection pump  
 Pump designation : PE6P110A320LS3835-2  
 EP type number : 0 411 816 761  
 Governor  
 Governor design. : RSV675...1025POA820-11

Governer no. : 0 421 833 347

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 441

1st version kW : 164.0  
 Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup>/ : 13.8...14.0

100 s: (13.5...14.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 675.0  
 Rack travel in mm : 3.4...4.0  
 Del.quantity cm<sup>3</sup>/ : 1.2...1.8  
 100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 138.0...140.0

1000 : (135.5...142.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 12.00  
Speed rpm : 1035...1045  
2nd rack travel in: 4.00  
Speed rpm : 1065...1083  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 675  
Rack travel in mm : 3.7

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 675  
Rack travel in mm : 3.40...4.00  
Rack travel in mm : 2.00  
Speed rpm : 680...720

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm3/ : 135.0...139.0  
1000 s: (132.0...142.0)  
Spread cm3 : 6.00  
1000 s: (8.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1035...0

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9a44  
 Edition : 05.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 036 083  
 Injection pump  
 Pump designation : PES6P120A720/3LS470-  
 2  
 EP type number : 0 412 026 050  
 Governor  
 Governor design. : RQ300/950PA813-17  
 Governor no. : 0 421 801 546

Customer-spec. information  
 Customer : MAN

Engine : D2866 LF 07

1st version kW : 213.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 10.20...10.30

Del. quantity cm<sup>3</sup>/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.7...4.9

Del. quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 1000

Del. quantity : 183.0...185.0

1000 : (180.0...188.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 8.80  
Speed rpm : 995...1010  
2nd rack travel in: 4.00  
Speed rpm : 1020...1150  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 300  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 355...395

#### TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 750  
Rack travel in m: 10.50...10.70  
3rd speed rpm : 850  
Rack travel in m: 10.10...10.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 10.20...10.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 85  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 160  
Rack travel in m: 9.70...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 950

Del.quantity cm3/ : 181.0...185.0  
1000 s: (178.0...188.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 995...1010

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 225.0...245.0  
1000 s: (221.0...249.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 12.0...18.0  
1000 s: (9.0...21.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 3-7086

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : RVI 9,8 a 3  
 Edition : 05.11.90  
 Replaces : 1.2.90  
 Test oil : ISO-4113

Combination no. : 0 402 046 300

Injection pump  
 Pump designation : PES6P120A32ORS419  
 EP type number : 0 412 026 037  
 Governor  
 Governor design. : RQV275...1100PA495-5  
 Governor no. : 0 421 813 446

Customer-spec. information  
 Customer : RVI

Engine : MIDR 062045

1st version kW : 191.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1100

---

Rack travel in mm : 9.00...9.10

---

Del.quantity cm<sup>3</sup>/ : 16.2...16.4  
 100 s: (15.9...16.7)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 4.0...4.4  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s: (1.6...2.8)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.00...1.20  
 2nd speed rpm : 450  
 travel mm : 3.40...3.80  
 3rd speed rpm : 850  
 travel mm : 6.10...6.30  
 4th speed rpm : 1100  
 travel mm : 8.00...8.20

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 700  
 Del.quantity : 162.0...164.0  
 1000 : (159.0...167.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 8.00  
Speed rpm : 1170...1180  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...8.00

LOW IDLE 1

Control lever  
position degrees: 60...68

Testing:

Speed rpm : 200  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 285...400

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 220  
Rack travel in m: 8.60...8.70  
3rd pressure hPa : 195  
Rack travel in m: 8.10...8.30

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm3/ : 150.0...156.0  
1000 s: (147.0...159.0)

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 102.0...104.0  
1000 s: (99.0...107.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: -1.00  
Speed rpm : 1170...1180

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : -4.00...-4.40  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (16.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 12,0 f1  
 Edition : 05.11.90  
 Replaces : 4.5.90  
 Test oil : ISO-4113

Combination no. : 0 402 046 758

Injection pump  
 Pump designation : PES6P120A32ORS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...950PA728-1  
 Governor no. : 0 421 813 465

Customer-spec. information  
 Customer : RVI

Engine : MIDR 063540

1st version kW : 243.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter  
 x wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 12.50...12.60

---

Del.quantity cm<sup>3</sup>/ : 19.7...19.9  
 100 s : (19.4...20.2)

---

Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.20...5.60  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.7  
 100 s : (1.8...3.0)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 275  
 travel mm : 1.30...1.70  
 2nd speed rpm : 450  
 travel mm : 3.30...3.70  
 3rd speed rpm : 800  
 travel mm : 5.60...6.00  
 4th speed rpm : 950  
 travel mm : 6.70...6.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del.quantity : 197.0...199.0  
 1000 : (194.0...202.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure nPa : 1000  
Rack travel mm : 12.50...12.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.40  
2nd pressure hPa : 520  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 200  
Rack travel in m: 10.10...10.40

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 196.0...202.0  
1000 s: (193.0...205.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 117.0...119.0  
1000 s: (114.0...122.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: -1.00  
Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 155.0...185.0  
1000 s: (151.0...189.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : -6.90...-7.30  
Del.quantity cm<sup>3</sup>/ : 21.0...27.0  
1000 s: (18.0...30.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 12,0 f2  
 Edition : 05.11.90  
 Replaces : 4.5.90  
 Test oil : ISO-4113

Combination no. : 0 402 046 791

Injection pump  
 Pump designation : PES6P120A32ORS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...950PA728-4  
 Governor no. : 0 421 813 678

Customer-spec. information  
 Customer : RVI

Engine : MIDR 063540 H

1st version kW : 264.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 13.30...13.40

---

Del.quantity cm<sup>3</sup>/ : 21.2...21.4  
 100 s: (20.9...21.7)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.60...6.00  
 Del.quantity cm<sup>3</sup>/ : 2.3...2.9  
 100 s: (2.0...3.2)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 275  
 travel mm : 1.30...1.70

2nd speed rpm : 450  
 travel mm : 3.30...3.70

3rd speed rpm : 800  
 travel mm : 5.60...6.00

4th speed rpm : 950  
 travel mm : 6.70...6.90

5th speed rpm : 1500  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del.quantity : 212.0...214.0  
 1000 : (209.0...217.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 12.30  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 65...73

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 275  
Rack travel in mm : 5.70...5.90

#### CONSTANT REGULATION

Speed rpm : 295...400

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.50  
2nd pressure hPa : 660  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 200  
Rack travel in m: 10.20...10.40

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 950

CO2

Del.quantity cm<sup>3</sup>/ : 210.0...216.0  
1000 s: (207.0...219.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 117.0...119.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: -1.00  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : -7.30...-7.70  
Del.quantity cm<sup>3</sup>/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 21,9 v 3  
 Edition : 17.10.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 640 807A

Injection pump  
 Pump designation : PE12P120A320LS7806  
 EP type number : 0 412 620 805  
 Governor  
 Governor design. : RQV400...1065PA835-2  
 Governor no. : 0 421 813 603

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 380.0  
 Rated speed : 2130

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 150...170

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)

Rack travel in mm : 9.00...12.00

Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 13.70...13.90

Del. quantity cm<sup>3</sup>/ : 19.7...20.0

100 s: (19.4...20.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.00...1.20

2nd speed rpm : 500  
 travel mm : 3.10...3.30

3rd speed rpm : 1100  
 travel mm : 7.30...7.70

4th speed rpm : 1225  
 travel mm : 8.30...8.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1180

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h : 700  
Del. quantity : 197.0...200.0  
1000 : (194.0...203.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1105...1115  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 400  
Rack travel in mm : 4.40...4.60

CONSTANT REGULATION  
Speed rpm : 400...600

TORQUE CONTROL  
Dimension a mm : 1.60  
Torque control curve - 1st version  
1st speed rpm : 1065  
Rack travel in m: 12.70...12.90  
2nd speed rpm : 975  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 900  
Rack travel in m: 13.90...14.10  
4th speed rpm : 800  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 13.70...13.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 500  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 950  
Rack travel in m: 14.10...14.20  
4th pressure hPa : 1100  
Rack travel in m: 14.20...14.40  
5th pressure hPa : -  
Rack travel in m: 10.90...11.10

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 1065  
Del. quantity cm<sup>3</sup>/ : 184.0...188.0  
1000 s: (181.0...191.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 212.0...216.0  
1000 s: (209.0...219.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 174.0...177.0  
1000 s: (171.0...180.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1105...1115

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:

APPLICATION

Rail car



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 22,0 c  
 Edition : 24.10.90  
 Replaces : 31.7.90  
 Test oil : ISO-4113

Combination no. : 0 402 640 817

Injection pump  
 Pump designation : PE12P120A520LS7826  
 EP type number : 0 412 620 817  
 Governor  
 Governor design. : RQV350...1150PA870-4  
 Governor no. : 0 421 813 717

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 736.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 150...170

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 19.00...21.00

Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 1150

Rack travel in mm : 15.20...15.30

Del.quantity cm<sup>3</sup>/ : 31.2...31.4

100 s: (30.9...31.7)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.30...1.80

2nd speed rpm : 600  
 travel mm : 3.30...3.80

3rd speed rpm : 960  
 travel mm : 5.30...5.80

4th speed rpm : 1206  
 travel mm : 7.90...8.40

5th speed rpm : 1291  
 travel mm : 9.80...10.30

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1800  
Del.quantity : 312.0...314.0  
1000 : (309.0...317.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

RATED SPEED

1st version

Control lever position degrees: 113...121

Testing:

1st rack travel in: 14.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever position degrees: 62...70

Testing:

Speed rpm : 250  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.30...5.90

CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.20...8.50

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 1100  
Rack travel in m: 13.80...14.10

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

C07

1st version

Aneroid pressure h: 1800  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 303.0...313.0  
1000 s: (300.0...316.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)  
Aneroid pressure h: 1800  
Speed rpm : 1150  
Del.quantity cm<sup>3</sup>/ : 240.0...243.0 \*  
1000 s: (237.0...246.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 124.0...126.0  
1000 s: (121.0...129.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 330.0...350.0  
1000 s: (326.0...354.0)

Remarks:

:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 r  
 Edition : 08.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 736 807  
  
 Injection pump  
 Pump designation : PES6P110A12ORS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1100PA964-1  
 K  
 Governor no. : 0 421 815 253  
  
 Customer-spec. information  
 Customer : C.D.C.  
  
 Engine : 6CTA-A  
  
 1st version kW : 201.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 047  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 115...125  
  
 Test nozzle holder  
 assembly : 1 688 901 101  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,6  
  
 Test lines : 1 680 750 008  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
  
 Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4  
  
 Phasing : 0-60-120-180-240-300  
  
 Tolerance + - ° : 0.50 (0.75)  
  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  


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 Rack travel in mm : 15.70...15.80  


---

 Del.quantity cm<sup>3</sup>/ : 20.6...20.8  
 100 s : (20.4...21.0)  


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 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)  


---

 2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 2.8...3.2  
 100 s : (2.6...3.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 600  
 travel mm : 5.10...5.50  
 4th speed rpm : 1000  
 travel mm : 8.10...8.30  
 5th speed rpm : 1200  
 travel mm : 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1500  
 Del.quantity : 206.0...208.0  
 1000 : (204.0...210.0)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

#### Testing:

1st rack travel in: 14.40  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1310...1340  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 15.70...15.80  
2nd speed rpm : 650  
Rack travel in m: 13.50...13.90  
3rd speed rpm : 1100  
Rack travel in m: 15.40...15.60

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 1050  
Pressure hPa : 1500  
Rack travel mm : 15.70...15.80

##### Measurement

Speed 1/min : 1050

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 340  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 840  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 198.5...202.5  
1000 s: (196.5...204.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 160.0...180.0  
1000 s: (155.0...185.0)  
Rack travel in mm : 11.40...12.40

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del. quantity cm<sup>3</sup>/ : 28.0...32.0  
1000 s: (26.0...34.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3916627

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 5,9 w 1  
 Edition : 08.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113

Combination no. : 0 402 736 810

Injection pump  
 Pump designation : PES6P110A12ORS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964-2  
 K  
 Governor no. : 0 421 815 254

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kw : 141.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm<sup>3</sup>/ : 15.9...16.1

100 s: (15.7...16.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 3.3...3.7  
 100 s: (3.1...3.9)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 1.40...1.60

3rd speed rpm : 600  
 travel mm : 2.90...3.30

4th speed rpm : 1300  
 travel mm : 7.20...7.40

5th speed rpm : 1500  
 travel mm : 9.10...9.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 1200  
 Del.quantity : 159.0...161.0  
 1000 : (157.0...163.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1295...1305  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 800  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 14.80...14.90

#### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 415  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 740  
Rack travel in m: 13.00...13.40

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 159.0...163.0  
1000 s: (157.0...165.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 95.5...99.5  
1000 s: (93.5...101.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1295...1305

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 155.0...175.0  
1000 s: (150.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 33.0...37.0  
1000 s: (31.0...39.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3919090

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 r 1  
 Edition : 08.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113

Combination no. : 0 402 736 814

Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-6  
 K  
 Governor no. : 0 421 815 258

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 187.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 14.50...14.60

Del. quantity cm<sup>3</sup>/ : 18.3...18.5  
 100 s: (18.1...18.7)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del. quantity cm<sup>3</sup>/ : 2.8...3.2  
 100 s: (2.6...3.4)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del. quantity : 183.0...185.0  
 1000 : (181.0...187.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1405...1435  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 11.60...12.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

#### Measurement

Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 270  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 700  
Rack travel in m: 12.60...13.00

#### START CUT-OUT

Speed 1/min : 265 (270)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 168.5...172.5  
1000 s: (166.5...174.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 28.0...32.0  
1000 s: (26.0...34.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3917089

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 r 2  
 Edition : 08.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 736 816  
  
 Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-8  
 K  
 Governor no. : 0 421 815 264  
  
 Customer-spec. information  
 Customer : C.D.C.  
  
 Engine : 6CTA-A  
  
 1st version kw : 213.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 047  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 115...125  
  
 Test nozzle holder  
 assembly : 1 688 901 101  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,6  
  
 Test lines : 1 680 750 008  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
  
 Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4  
  
 Phasing : 0-60-120-180-240-300  
  
 Tolerance + - ° : 0.50 (0.75)  
  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  


---

 Rack travel in mm : 14.70...14.80  


---

 Del. quantity cm<sup>3</sup>/ : 19.0...19.2  
 100 s: (18.8...19.4)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

 2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del. quantity cm<sup>3</sup>/ : 2.8...3.2  
 100 s: (2.6...3.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 700  
 travel mm : 5.90...6.30  
 4th speed rpm : 1200  
 travel mm : 9.00...9.20  
 5th speed rpm : 1400  
 travel mm : 10.70...11.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del. quantity : 190.0...192.0  
 1000 : (188.0...194.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 650  
Rack travel in m: 12.50...12.90  
3rd speed rpm : 1200  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.80

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 260  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 710  
Rack travel in m: 12.80...13.20

#### START CUT-OUT

Speed 1/min : 265 (270)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 182.0...186.0  
1000 s: (180.0...188.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del. quantity cm<sup>3</sup>/ : 28.0...32.0  
1000 s: (26.0...34.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C # 3916626

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 D 21  
 Edition : 21.09.90  
 Replaces : 16.05.88  
 Test oil : ISO-4113

Combination no. : 0 403 446 187

Injection pump  
 Pump designation : PES6MW100/720RS1129  
 EP type number : 0 413 406 121  
 Governor  
 Governor design. : RQV300...1300MW50-2  
 Governor no. : 0 420 083 124

Customer-spec. information  
 Customer : DB

Engine : DM 366 LA

1st version kW : 150.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

---

Rack travel in mm : 11.20...11.30

---

Del. quantity cm<sup>3</sup>/ : 9.8...10.0

---

100 s: (9.6...10.2)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.5...5.6  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.1  
 100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1340  
 travel mm : 8.60...8.80

2nd speed rpm : 1430  
 travel mm : 9.30...9.70

3rd speed rpm : 300  
 travel mm : 1.20...1.60

4th speed rpm : 700  
 travel mm : 3.80...4.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del. quantity : 98.0...100.0  
 1000 : (96.0...102.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**



1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 10.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 51...59  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.50...5.60

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

CONSTANT REGULATION  
Speed rpm : 320...530

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 400  
Rack travel mm : 9.90..10.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.60  
2nd pressure hPa : 500  
Rack travel in m: 10.80...11.10  
3rd pressure hPa : 1000  
Rack travel in m: 11.20...11.30

START CUT-OUT

Speed 1/min : 220 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000

Speed rpm : 600  
Del.quantity cm3/ : 83.5...86.5  
1000 s: (81.0...89.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.50...5.60  
Del.quantity cm3/ : 9.0...11.0  
1000 s: (6.0...14.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : IHC 7,6 V  
 Edition : 05.11.90  
 Replaces : 01.12.89  
 Test oil : ISO-4113

Combination no. : 0 403 446 230

Injection pump  
 Pump designation : PES6MW100/32ORS1185  
 EP type number : 0 413 406 170  
 Governor  
 Governor design. : RQV350...1200MW64-2  
 Governor no. : 0 420 083 194

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 201.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85  
 : (3.70...3.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1350  
 travel mm : 8.30...8.50

2nd speed rpm : 1460  
 travel mm : 9.10...9.50

3rd speed rpm : 550  
 travel mm : 3.10...3.70

4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 800  
 Del.quantity : 142.5...144.5  
 1000 : (140.5...146.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 42...50

Testing:

1st rack travel in: 13.00  
Speed rpm : 1265...1285  
2nd rack travel in: 4.00  
Speed rpm : 1415...1425  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION

Speed rpm : 360...450

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 800  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 1150  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 265  
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 480  
Rack travel in m: 13.30...13.60  
3rd pressure hPa : 800  
Rack travel in m: 14.40...14.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 800  
Del.quantity cm3/ : 151.0...155.0  
1000 s: (149.0...157.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 83.5...85.5  
1000 s: (81.5...87.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1265...1285

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1815225C91#

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter. Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 X  
 Edition : 28.09.90  
 Replaces : 16.08.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 239

Injection pump  
 Pump designation : PES6MM100/320RS1189  
 EP type number : 0 413 406 177  
 Governor  
 Governor design. : RQV350...1200MW46-21  
 Governor no. : 0 420 083 201

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 800

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 15.2...15.4  
 100 s: (15.0...15.6)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 1450  
 travel mm : 9.80...10.20  
 2nd speed rpm : 1250  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del.quantity : 152.0...154.0  
 1000 : (150.0...156.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1280...1300  
2nd rack travel in: 4.00  
Speed rpm : 1435...1445  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.50

Measurement  
Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 550  
Rack travel in m: 12.50...12.90  
3rd pressure hPa : 900  
Rack travel in m: 14.00...14.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 140.0...144.0  
1000 s: (138.0...146.0)

Spread cm<sup>3</sup> : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 62.0...64.0  
1000 s: (60.0...66.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1280...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1815503C91#  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 W 6  
 Edition : 19.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 240  
 Injection pump  
 Pump designation : PES6MW100/320RS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RQV350...1200MW46-22  
 Governor no. : 0 420 083 202

Customer spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 164.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 800  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm<sup>3</sup>/ : 12.9...13.1  
 100 s: (12.7...13.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20  
 2nd speed rpm : 1250  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del.quantity : 129.0...131.0  
 1000 : (127.0...133.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 104...112

Testing:

1st rack travel in: 11.00  
Speed rpm : 1285...1305  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack trave: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.20...9.30

Measurement

Speed 1/min : 500

1st pressure hPa : 275  
Rack travel in m: 9.90...10.00  
2nd pressure hPa : 550  
Rack travel in m: 11.40...11.80  
3rd pressure hPa : 900  
Rack travel in m: 12.00...12.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm3/ : 126.5...130.5  
1000 s: (124.5...132.5)  
Spread cm3 : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1285...1305

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IGC #1815521C91#

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : IHC 7,6 W 1  
 Edition : 28.09.90  
 Replaces : 10.08.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 241  
 Injection pump  
 Pump designation : PES6MM100/320RS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RGV350...1200MW46-23  
 Governor no. : 0 420 083 203

Customer-spec. information  
 Customer : NAVISTAR

Engine : DT -466

1st version kW : 157.0  
 Rated speed : 2400

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038  
 Inlet press., bar : 2.80  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.80...10.20

2nd speed rpm : 1250

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 900

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

### RATED SPEED

1st version



Control lever  
position degrees: 102...110

Testing:

1st rack travel in: 11.10  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500

1st pressure hPa : 220  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 500  
Rack travel in m: 11.30...11.70  
3rd pressure hPa : 900  
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 128.0...132.0  
1000 s: (126.0...134.0)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 12.50...13.50

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1815518C91#  
Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 W 4  
 Edition : 28.09.90  
 Replaces : 31.08.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 242

Injection pump  
 Pump designation : PES6MM100/320RS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RQV350...1200MW46-24  
 Governor no. : 0 420 083 204

Customer-spec. information  
 Customer : NAVISTAR

Engine : DT -466

1st version kW : 157.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 800

---

Rack travel in mm : 12.10...12.20

---

Del.quantity cm3/ : 13.3...13.5  
 100 s: (13.1...13.7)

---

Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm3/ : 1.6...2.0  
 100 s: (1.3...2.2)

Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20

2nd speed rpm : 1250  
 travel mm : 7.90...8.10

3rd speed rpm : 550  
 travel mm : 3.10...3.70

4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del.quantity : 133.0...135.0  
 1000 : (131.0...137.0)

Spread cm3 : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 102...110

Testing:  
1st rack travel in: 11.10  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...9.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 215  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 425  
Rack travel in m: 11.40...11.80  
3rd pressure hPa : 900  
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm3/ : 128.0...132.0  
1000 s: (126.0...134.0)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 88.0...90.0  
1000 s: (86.0...92.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 12.50...13.50

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1815515C91#  
Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 X 2  
 Edition : 28.09.90  
 Replaces : 31.08.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 244

Injection pump  
 Pump designation : PES6MW100/32ORS1189  
 EP type number : 0 413 406 177  
 Governor  
 Governor design. : RQV350...1200MW46-26  
 Governor no. : 0 420 083 206

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 201.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 800

Rack travel in mm : 14.50...14.60

Del.quantity cm<sup>3</sup>/ : 16.1...16.3

100 s: (15.9...16.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20

2nd speed rpm : 1250  
 travel mm : 7.90...8.10

3rd speed rpm : 550  
 travel mm : 3.10...3.70

4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 1200  
 Del.quantity : 161.0...163.0  
 1000 : (159.0...165.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 102...110

Testing:

1st rack travel in: 13.10  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1430...1440  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 1200  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 1050  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.00

Measurement

Speed 1/min : 500

1st pressure hPa : 275  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 585  
Rack travel in m: 12.90...13.20  
3rd pressure hPa : 1200  
Rack travel in m: 14.50...14.60

START CUT-OUT

Speed 1/min : 280 (290)

D01

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)  
Spread cm3 : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.5...63.5  
1000 s: (59.5...65.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...190.0  
1000 s: (147.0...193.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1815520C91#

In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,7 A  
 Edition : 17.10.90  
 Replaces : 10.08.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 245

Injection pump  
 Pump designation : PES6MM100/32ORS1204  
 EP type number : 0 413 406 192  
 Governor  
 Governor design. : RQV350...1350MM45-27  
 Governor no. : 0 420 083 207

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-360

1st version kW : 138.0  
 Rated speed : 2700

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 11.2...11.4

100 s: (11.0...11.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 8.20...8.60

2nd speed rpm : 1350  
 travel mm : 7.40...7.60

3rd speed rpm : 500  
 travel mm : 2.50...3.10

4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del.quantity : 112.0...114.0  
 1000 : (110.0...116.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 104...112

Testing:

1st rack travel in: 9.80  
Speed rpm : 1415...1435  
2nd rack travel in: 4.00  
Speed rpm : 1510...1520  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.70...8.80

Measurement

Speed 1/min : 500

1st pressure hPa : 210  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 410  
Rack travel in m: 10.10...10.50  
3rd pressure hPa : 900  
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1350  
Del.quantity cm<sup>3</sup>/ : 107.5...111.5  
1000 s: (105.5...113.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 68.0...70.0  
1000 s: (66.0...72.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1415...1435

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (127.0...173.0)  
Rack travel in mm : 13.00...14.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1815516C91#  
Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 V  
 Edition : 14.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 247  
 Injection pump  
 Pump designation : PES6MM100/72ORS1195  
 EP type number : 0 413 406 183  
 Governor  
 Governor design. : RQV300...1150MM107  
 Governor no. : 0 420 083 208

Customer-spec. information  
 Customer : KHD

Engine : BF 6L 913 C

1st version kW : 101.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00

D04

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.70...9.80

Del. quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 315.0

Rack travel in mm : 7.5...7.7

Del. quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1200  
 travel mm : 9.80...10.20

2nd speed rpm : 800  
 travel mm : 5.90...6.10

3rd speed rpm : 450  
 travel mm : 3.00...3.60

4th speed rpm : 300  
 travel mm : 1.60...2.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del. quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)



## RATED SPEED

1st version

Control lever  
position degrees: 40...48

Testing:

1st rack travel in: 8.70  
Speed rpm : 1180...1190  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 7.6

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 315  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 420...480

## TORQUE CONTROL

Dimension a mm : 0.75  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 800  
Rack travel in m: 10.30...10.50  
3rd speed rpm : 1030  
Rack travel in m: 10.00...10.20

## Aneroid/Altitude Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.20

Measurement

Speed 1/min : 500  
2nd pressure hPa : 450  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 1000  
Rack travel in m: 10.30...10.50

## START CUT-OUT

Speed 1/min : 230 (250)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 69.0...71.0  
1000 s: (67.0...73.0)

## BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1180...1190

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 110.0...130.0  
1000 s: (107.0...133.0)

## LOW IDLE

Speed rpm : 315  
Rack travel in mm : 7.50...7.70  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Test electrically-released starting  
quantity (EES) with 12 volts

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 F
Edition : 17.09.90
Replaces : 29.06.90
Test oil : ISO-4113
Combination no. : 0 403 446 251
Injection pump
Pump designation : PES6MM100/32ORS1202
EP type number : 0 413 406 187
Governor
Governor design. : RQ750MW112
Governor no. : 0 420 082 042

Customer-spec. information
Customer : RVI

Engine : LDR 10

1st version kW : 100.0
Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 9.00...12.00

006

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm3 : 0.3

100 s: (0.6)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Del.quantity : 133.5...135.5
1000 : (131.5...137.5)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 29...35

Testing:
1st rack travel in: 13.50
Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 795...805
4th rack travel in: 825
Speed rpm : 0.00...1.00

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.50
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 70.0...80.0
1000 s: (67.0...83.0)

Rack travel in mm : 19.00...21.00

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,7 A 2  
 Edition : 17.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 252  
 Injection pump  
 Pump designation : PES6MM100/32ORS1204  
 EP type number : 0 413 406 192  
 Governor  
 Governor design. : RQV350...1350MM46-28  
 Governor no. : 0 420 083 214

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-366

1st version kW : 127.0  
 Rated speed : 2700

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038  
 Inlet press., bar : 2.80  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850  
 Rack travel in mm : 10.80...10.90  
 Del.quantity cm<sup>3</sup>/ : 11.2...11.4  
 100 s: (11.0...11.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 8.20...8.60  
 2nd speed rpm : 1350  
 travel mm : 7.40...7.60  
 3rd speed rpm : 500  
 travel mm : 2.50...3.10  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del.quantity : 112.5...114.5  
 1000 : (110.5...116.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control Lever  
position degrees: 102...110

Testing:

1st rack travel in: 9.80  
Speed rpm : 1420...1440  
2nd rack travel in: 4.00  
Speed rpm : 1520...1530  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.00...8.10

Measurement

Speed 1/min : 500

1st pressure hPa : 205  
Rack travel in m: 8.70...8.80  
2nd pressure hPa : 395  
Rack travel in m: 9.90...10.30  
3rd pressure hPa : 900  
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1350  
Del.quantity cm<sup>3</sup>/ : 108.0...111.0  
1000 s: (105.5...113.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 57.5...59.5  
1000 s: (55.5...61.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1420...1440

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 13.00...14.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1816727C91#  
Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 X 1
Edition : 28.09.90
Replaces : 16.08.90
Test oil : ISO-4113
Combination no. : 0 403 446 255
Injection pump
Pump designation : PES6MW100/32ORS1189
EP type number : 0 413 406 177
Governor
Governor design. : RQV350...1200MW46-30
Governor no. : 0 420 083 218

Customer-spec. information
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 201.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
: (3.20...3.40)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 16.1...16.3

100 s: (15.9...16.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450
travel mm : 9.80...10.20

2nd speed rpm : 1250
travel mm : 7.90...8.10

3rd speed rpm : 550
travel mm : 3.10...3.70

4th speed rpm : 350
travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 800
Aneroid pressure h: 1200
Del.quantity : 161.0...163.0
1000 : (159.0...165.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 102...110

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1430...1440  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 1200  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 1050  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 260  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 650  
Rack travel in m: 13.20...13.50  
3rd pressure hPa : 1200  
Rack travel in m: 14.50...14.60

START CUT-OUT

Speed 1/min : 280 (290)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)  
Spread cm<sup>3</sup> : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 83.5...85.5  
1000 s: (81.5...87.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1270...1290

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...190.0  
1000 s: (147.0...193.0)  
Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
: IHC #1816731C91#

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter.  
In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 W 5  
 Edition : 19.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 256  
 Injection pump  
 Pump designation : PES6MW100/32ORS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RQV350...1200MW46-38  
 Governor no. : 0 420 083 219

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 164.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 800

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 12.9...13.1

100 s: (12.7...13.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20

2nd speed rpm : 1250  
 travel mm : 7.90...8.10

3rd speed rpm : 550  
 travel mm : 3.10...3.70

4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del.quantity : 129.0...131.0  
 1000 : (127.0...133.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control Lever  
 position degrees: 104...112



Testing:

1st rack travel in: 11.00  
Speed rpm : 1285...1305  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 235  
Rack travel in m: 10.10...10.20  
2nd pressure hPa : 485  
Rack travel in m: 11.10...11.50  
3rd pressure hPa : 900  
Rack travel in m: 12.00...12.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm3/ : 126.5...130.5  
1000 s: (124.5...132.5)  
Spread cm3 : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 81.5...83.5  
1000 s: (79.5...83.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1285...1305

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1816726C91#

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 58  
 Edition : 17.09.90  
 Replaces : 16.08.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 258

Injection pump  
 Pump designation : PES6MW100/72ORS1129  
 EP type number : 0 413 406 121  
 Governor  
 Governor design. : RQV300...1300MW50-8  
 Governor no. : 0 420 083 222

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 149.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

---

Rack travel in mm : 11.50...11.60

---

Del.quantity cm<sup>3</sup>/ : 10.1...10.3  
 100 s: (9.9...10.5)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.5...5.6  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.1  
 100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.40...10.00

2nd speed rpm : 1350  
 travel mm : 8.50...8.70

3rd speed rpm : 450  
 travel mm : 2.40...3.00

4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del.quantity : 101.0...103.0  
 1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 10.50  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.50...5.60

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

CONSTANT REGULATION  
Speed rpm : 320...530

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 300  
Rack travel mm : 8.30...8.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.40...7.50  
2nd pressure hPa : 450  
Rack travel in m: 10.00...10.20  
3rd pressure hPa : 1000  
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 220 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000

Speed rpm : 600  
Del.quantity cm3/ : 85.5...88.5  
1000 s: (83.0...91.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 27.0...29.0  
1000 s: (25.0...31.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.50...5.60  
Del.quantity cm3/ : 9.0...11.0  
1000 s: (6.0...14.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,7 A 3  
 Edition : 17.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 261  
 Injection pump  
 Pump designation : PES6MM100/320RS1204  
 EP type number : 0 413 406 192  
 Governor  
 Governor design. : RQV350...1350MW46-32  
 Governor no. : 0 420 083 225

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-360CHT

1st version kW : 138.0  
 Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850  
 Rack travel in mm : 11.50...11.60  
 Del.quantity cm<sup>3</sup>/ : 12.0...12.2  
 100 s: (11.8...12.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 8.20...8.60  
 2nd speed rpm : 1350  
 travel mm : 7.40...7.60  
 3rd speed rpm : 500  
 travel mm : 2.50...3.10  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del.quantity : 120.0...122.0  
 1000 : (118.0...124.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1415...1435  
2nd rack travel in: 4.00  
Speed rpm : 1510...1520  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1350  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 850  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 1050  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 7.90...8.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 8.80...8.90  
2nd pressure hPa : 580  
Rack travel in m: 10.40...10.80  
3rd pressure hPa : 900  
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 280 (290)

D17

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1350  
Del.quantity cm<sup>3</sup>/ : 107.5...111.5  
1000 s: (105.5...113.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 54.0...56.0  
1000 s: (52.0...58.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1415...1435

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 13.00...14.00

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : IHC #1817192C91#

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter.  
In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 W 2  
 Edition : 17.09.90  
 Replaces : 16.08.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 262

Injection pump  
 Pump designation : PES6MM100/32ORS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RGV350...1200MW46-33  
 Governor no. : 0 420 083 226

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 172.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 800

---

Rack travel in mm : 12.10...12.20

---

Del.quantity cm<sup>3</sup>/ : 13.1...13.3

---

100 s: (12.9...13.5)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20

2nd speed rpm : 1250  
 travel mm : 7.80...8.10

3rd speed rpm : 550  
 travel mm : 3.10...3.70

4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del.quantity : 131.0...133.0  
 1000 : (129.0...135.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 98...106

Testing:

1st rack travel in: 11.10  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.10...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 575  
Rack travel in m: 11.30...11.70  
3rd pressure hPa : 900  
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm3/ : 128.5...132.5  
1000 s: (126.5...134.5)  
Spread cm3 : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 72.0...74.0  
1000 s: (70.0...76.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (127.0...173.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1817194C91#

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 W 3  
 Edition : 17.09.90  
 Replaces : 16.08.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 263

Injection pump  
 Pump designation : PES6MW100/32ORS1198  
 EP type number : 0 413 406 188  
 Governor  
 Governor design. : RQV350...1200MW46-34  
 Governor no. : 0 420 083 227

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 172.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 800

---

Rack travel in mm : 12.10...12.20

---

Del.quantity cm<sup>3</sup>/ : 13.1...13.3  
 100 s: (12.9...13.5)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20

2nd speed rpm : 1250  
 travel mm : 7.90...8.10

3rd speed rpm : 550  
 travel mm : 3.10...3.70

4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del.quantity : 131.0...133.0  
 1000 : (129.0...135.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 98...106



Testing:

1st rack travel in: 11.10  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.20...9.30

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 575  
Rack travel in m: 11.20...11.60  
3rd pressure hPa : 900  
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 128.5...132.5  
1000 s: (126.5...134.5)  
Spread cm<sup>3</sup> : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 76.0...78.0  
1000 s: (74.0...80.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (127.0...173.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1817193C91#

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter. In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 D 81  
 Edition : 17.10.90  
 Replaces : 05.03.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 264

Injection pump  
 Pump designation : PES6MW100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQ300/1200MW96-1  
 Governor no. : 0 420 082 045

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 116.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.9...8.1

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.8...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1300

travel mm : 8.10...8.50

2nd speed rpm : 1200

travel mm : 6.90...7.10

3rd speed rpm : 550

travel mm : 5.40...6.00

4th speed rpm : 300

travel mm : 2.40...2.80

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: 108

Speed rpm : 900

Rack travel in mm : 14.70...16.30

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1200

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control Lever  
position degrees: 96...104

Setting point:  
Speed rpm : 900  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1240...1255  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.0

Testing:  
Speed rpm : 200  
Minimum rack travel: 9.50  
Speed rpm : 300  
Rack travel in mm : 7.90...8.10

CONSTANT REGULATION  
Speed rpm : 330...500

#### START CUT-OUT

Speed 1/min : 230 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 62.0...65.0  
1000 s: (59.5...67.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1240...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 80.0...90.0  
1000 s: (77.0...93.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.90...8.10  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (8.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 D 99  
 Edition : 19.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 270  
 Injection pump  
 Pump designation : PES6MW100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQV300...1300MW50-10  
 Governor no. : 0 420 083 234

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 10.90...11.00  
 Del. quantity cm<sup>3</sup>/ : 7.2...7.4  
 100 s: (7.0...7.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 7.8...8.0  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.6...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1350  
 travel mm : 8.50...8.70  
 2nd speed rpm : 1450  
 travel mm : 9.50...9.90  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.20...1.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 900  
 Del. quantity : 72.0...74.0  
 1000 : (70.0...76.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 110...118

Testing:

1st rack travel in: 9.90  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 80...88  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.9  
Speed rpm : 300  
Rack travel in mm : 7.80...8.00

CONSTANT REGULATION

Speed rpm : 330...500

TORQUE CONTROL

Dimension a mm : 1.30  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 800  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 585  
Rack travel in m: 12.20...12.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 460  
Rack travel in m: 11.20...11.50  
3rd pressure hPa : 900  
Rack travel in m: 12.20...12.30

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 71.0...74.0  
1000 s: (68.5...76.5)

Spread cm3 : 5.00  
1000 s: (7.0)

Aneroid pressure h: 900  
Speed rpm : 585  
Del.quantity cm3/ : 65.0...68.0  
1000 s: (62.5...70.5)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 27.0...29.0  
1000 s: (25.0...31.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 9.90  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.80...8.00  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,1 A  
 Edition : 05.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 271  
 Injection pump  
 Pump designation : PES6MW100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQV300...1300MW50-11  
 Governor no. : 0 420 083 235

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kw : 129.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.9...9.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 108...116

Testing:

1st rack travel in: 10.40

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1425...1455

4th rack travel in: 1550

Speed rpm : 0.00...1.00

**LOW IDLE 1**

Control Lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 9.0  
Speed rpm : 300  
Rack travel in mm : 8.90...9.10

CONSTANT REGULATION  
Speed rpm : 330...500

TORQUE CONTROL  
Dimension a mm : 1.10  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 600  
Rack travel in m: 12.50...12.60  
3rd speed rpm : 1000  
Rack travel in m: 11.50...11.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.80...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 225  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 325  
Rack travel in m: 11.90...12.10  
3rd pressure hPa : 900  
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 67.0...70.0  
1000 s: (64.5...72.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 37.0...39.0  
1000 s: (35.0...41.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.90...9.10  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 Q  
Edition : 17.09.90  
Replaces : 24.11.89  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 111  
  
Injection pump  
Pump designation : PES6MW100/321RS1186  
EP type number : 0 413 406 168  
Governor  
Governor design. : RQ250/1200MW84-4  
Governor no. : 0 420 082 044

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH

1st version kW : 157.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.70...14.80

Del. quantity cm<sup>3</sup>/ : 12.6...12.8

100 s : (12.4...13.0)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 1.9...2.3

100 s : (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280  
travel mm : 9.50...9.90

2nd speed rpm : 1250  
travel mm : 7.50...7.70

3rd speed rpm : 350  
travel mm : 5.20...5.80

4th speed rpm : 250  
travel mm : 2.20...2.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1200

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del. quantity : 126.0...128.0

1000 : (124.0...130.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)



## RATED SPEED

1st version  
Control lever  
position degrees: 104...112

Setting point:  
Speed rpm : 1200  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.50...5.70

## TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 600  
Rack travel in m: 14.80...14.90  
3rd speed rpm : 800  
Rack travel in m: 14.80...14.90  
4th speed rpm : 1200  
Rack travel in m: 14.30...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.40  
2nd pressure hPa : 400  
Rack travel in m: 13.80...14.10

3rd pressure hPa : 1000  
Rack travel in m: 14.80...14.90

## START CUT-OUT

Speed 1/min : 180 (200)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 126.5...129.5  
1000 s: (124.0...132.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

Aneroid pressure h: 1000  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 126.5...129.5  
1000 s: (124.0...132.0)

Aneroid pressure h: 1000  
Speed rpm : 1200  
Del. quantity cm<sup>3</sup>/ : 123.0...126.0  
1000 s: (120.5...128.5)

Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.50...5.70  
Del. quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : MAN #3-7008#

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1

start of delivery



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 7,3 A  
 Edition : 05.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 112  
 Injection pump  
 Pump designation : PES6MW100/321RS1190  
 EP type number : 0 413 406 176  
 Governor  
 Governor design. : RQ250/1100MW84-5  
 Governor no. : 0 420 082 046

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LOH05

1st version kW : 150.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000  


---

 Rack travel in mm : 14.80...14.90  


---

 Del.quantity cm<sup>3</sup>/ : 13.2...13.4  


---

 100 s: (13.0...13.6)

Spread cm<sup>3</sup> : 0.3  


---

 100 s: (0.6)

2nd speed rpm : 250.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.3  
 100 s: (1.6...2.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 1200  
 travel mm : 9.30...9.70  
 2nd speed rpm : 1100  
 travel mm : 7.30...7.50  
 3rd speed rpm : 470  
 travel mm : 6.70...7.30  
 4th speed rpm : 250  
 travel mm : 1.40...1.80

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: 89  
 Speed rpm : 600  
 Rack travel in mm : 16.00...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1000  
 Del.quantity : 132.0...134.0  
 1000 : (130.0...136.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 86...94

Setting point:  
Speed rpm : 600  
Rack travel in mm : 16.9

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 50...58  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 250  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : 450  
Rack travel in m: 13.70...14.00  
3rd pressure hPa : 1000  
Rack travel in m: 14.80...14.90

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000

EO4

Speed rpm : 600  
Del.quantity cm3/ : 128.5...131.5  
1000 s: (126.0...134.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 131.5...134.5  
1000 s: (129.0...137.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: : MAN #3-7115#

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 C10  
 Edition : 28.09.90  
 Replaces : 01.12.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 466 112  
 Injection pump  
 Pump designation : PES6MM100/12DRS1137  
 EP type number : 0 413 406 131  
 Governor  
 Governor design. : RSV425...1100MW2A319  
 -8  
 Governor no. : 0 420 085 104

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CTA-8.3 L

1st version kw : 188.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 017  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

E05

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 14.30...14.40  
 Del.quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s: (14.7...15.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 425.0  
 Rack travel in mm : 7.7...7.9  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.3  
 100 s: (1.6...2.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 149.0...151.0  
 1000 : (147.0...153.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 42...50

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.30  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1235...1265  
3rd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 7.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 490...550

TORQUE CONTROL

Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 750  
Rack travel in m: 15.30...15.40  
3rd speed rpm : 900  
Rack travel in m: 14.70...15.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm3/ : 158.5...161.5  
1000 s: (156.0...164.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (122.0...148.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 425  
Rack travel in mm : 7.70...7.90  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CDC #3915970#

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

Starting/full-load transition speed  
from holding magnet = 500 1/min.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 I 6  
Edition : 21.09.90  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 466 117JA  
  
Injection pump  
Pump designation : PES6MW100/120RS1178  
EP type number : 0 413 406 160  
Governor  
Governor design. : RSV350...1250MW2A332  
-3  
Governor no. : 0 420 085 152

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CT

1st version kW : 204.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

E07

Prestroke mm : 3.45...3.55  
: (3.40...3.60)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.10...14.20

Del. quantity cm<sup>3</sup>/ : 15.4...15.6

100 s: (15.2...15.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.2...6.4

Del. quantity cm<sup>3</sup>/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del. quantity : 154.0...156.0

1000 : (152.0...158.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 53...61

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
3rd rack travel in: 4.00  
Speed rpm : 1315...1345  
4th rack travel in: 1650  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 30...38  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 255  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 435  
Rack travel in m: 13.00...13.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 88.5...92.5  
1000 s: (86.5...94.5)

#### BREAKAWAY

1st version

E08

1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...180.0  
1000 s: (155.0...185.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.20...6.40  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
: CDC #3916293#

Start-of-delivery mark at 14° angular displacement of the cam after start of delivery of cylinder 1

Starting/full-load transition speed from holding magnet = 500 1/min.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : LIE 8,4 E  
 Edition : 05.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 474 012  
 Injection pump  
 Pump designation : PES4MW100/720RS1207  
 EP type number : 0 413 404 113  
 Governor  
 Governor design. : RSV350...1000MWOA333  
 -1  
 Governor no. : 0 420 085 153

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 914 T

1st version kW : 110.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
 : (3.25...3.45)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1275  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 390...450

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 700  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 500  
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm3/ : 132.0...135.0  
1000 s: (129.5...137.5)  
Spread cm3 : 3.50  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 D 98  
 Edition : 14.09.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 064B  
 Injection pump  
 Pump designation : PES6MM100/720RS1129  
 EP type number : 0 413 406 121  
 Governor  
 Governor design. : RSV350...1300MWOA329  
 -2  
 Governor no. : 0 420 085 095

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 132.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 10.00...10.10

Del.quantity cm<sup>3</sup>/ : 7.8...8.0  
 100 s: (7.6...8.2)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.5...5.7  
 Del.quantity cm<sup>3</sup>/ : 0.8...1.2  
 100 s: (0.6...1.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 900  
 Del.quantity : 78.0...80.0  
 1000 : (76.0...82.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 106...114

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 9.00  
 Speed rpm : 1240...1250  
 2nd rack travel in: 4.00

Speed rpm : 1285...1315  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.50...5.70

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 1.50  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 600  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 800  
Rack travel in m: 10.90...11.10  
4th speed rpm : 900  
Rack travel in m: 10.50...10.70

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.50...9.60

##### Measurement

Speed 1/min : 500

1st pressure hPa : 175  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 300  
Rack travel in m: 11.20...11.50  
3rd pressure hPa : 900  
Rack travel in m: 11.50...11.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 81.0...84.0  
1000 s: (78.5...86.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 82.0...85.0  
1000 s: (79.5...87.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.00  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (6.0...14.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : LIE 8,4 D  
 Edition : 17.09.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 081  
 Injection pump  
 Pump designation : PES6MW100/72ORS1196  
 EP type number : 0 413 406 184  
 Governor  
 Governor design. : RSV350...1050MWA338  
 Governor no. : 0 420 085 138

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
 : (3.35...3.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s : (13.1...13.7)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 4.0...4.5

Del.quantity cm<sup>3</sup>/ : 1.4...1.8

100 s : (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1050

Aneroid pressure h: 750

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.10

Speed rpm : 1070...1080  
2nd rack travel in: 3.00  
Speed rpm : 1100...1120  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 4.00...4.50

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 10.50...10.60

#### Measurement

Speed 1/min : 550

1st pressure hPa : 200  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 750  
Rack travel in m: 11.10...11.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...128.0  
1000 s: (122.5...130.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 750  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 132.0...135.0  
1000 s: (129.5...137.5)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (118.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 4.00...4.50  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 7,2 X 1  
 Edition : 17.09.90  
 Replaces : 31.07.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 082  
 Injection pump  
 Pump designation : PES6MM100/32ORS1180-  
 1  
 EP type number : 0 413 406 193  
 Governor  
 Governor design. : RSV300...1100MWOA339  
 Governor no. : 0 420 085 139

Customer-spec. information  
 Customer : MAN

Engine : D0826LUE51/160

1st version kW : 118.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 10.10...10.20

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.4

Del.quantity cm<sup>3</sup>/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 93...101

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.10  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 800  
Rack travel in m: 10.80...10.90  
3rd speed rpm : 600  
Rack travel in m: 10.80...10.90

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 220  
Rack travel mm : 9.60...9.70

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.40  
2nd pressure hPa : 380  
Rack travel in m: 10.50...10.80  
3rd pressure hPa : 1000  
Rack travel in m: 10.80...10.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 109.5...112.5  
1000 s: (107.0...115.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 108.0...111.0  
1000 s: (105.5...113.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 70.0...72.0  
1000 s: (68.0...74.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1150...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40  
Del.quantity cm<sup>3</sup>/ : 6.0...10.0  
1000 s: (4.0...12.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7062#  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 8,3 a81  
 Edition : 26.03.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 449AB

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3352892-VERSA001

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kw : 125.1  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...7.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1000

---

Rack travel in mm : 10.70...10.80

---

Del. quantity cm<sup>3</sup>/ : 9.3...9.5  
 100 s: (9.1...9.7)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

---

2nd speed rpm : 400.0  
 Rack travel in mm : 5.4...5.6  
 Del. quantity cm<sup>3</sup>/ : 1.3...1.7  
 100 s: (1.0...1.9)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Del. quantity : 93.0...95.0  
 1000 : (91.0...97.0)

---

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 82...90

Testing:  
1st rack travel in: 9.70  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 530...590

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 10.70...10.90  
5th speed rpm : 400  
Rack travel in m: 11.10...11.60

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.70  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)

Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 a75  
 Edition : 26.03.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 449AG

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3353251-VERSA006

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 133.2  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...7.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1000

---

Rack travel in mm : 10.70...10.80

---

Del.quantity cm<sup>3</sup>/ : 9.6...9.8  
 100 s: (9.4...10.0)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

---

2nd speed rpm : 400.0  
 Rack travel in mm : 5.1...5.3  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Del.quantity : 96.0...98.0  
 1000 : (94.0...100.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 82...90

Testing:

1st rack travel in: 9.70  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 550...610

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 11.40...11.50  
4th speed rpm : 835  
Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 95.0...98.0  
1000 s: (92.5...100.5)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 103.0...106.0  
1000 s: (100.5...108.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

E20

Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 a80  
 Edition : 26.03.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 449AI  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3352894-VERSA008

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 139.8  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...7.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1250

Del.quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 90...98

Testing:

1st rack travel in: 10.10  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 61...69  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 500  
Rack travel in m: 11.10...11.30  
5th speed rpm : 400  
Rack travel in m: 11.50...12.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 8.0...12.0  
1000 s: (5.5...14.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a79
Edition : 26.03.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 083 449BC
Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 025
Governor
Governor design. : RSV400...1100A2C2209
R
Governor no. : 9 420 083 201
Cust. part no. : 3353232-VERSA012

Customer-spec. information
Customer : CUMMINS
Engine : 6 CT 8.3
1st version kW : 154.6
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 047
Inlet press., bar : 1.50
Test nozzle holder
assembly : 0 681 343 009
Opening
pressure, bar : 172...175
Test lines : 1 680 750 014
Outside diameter
x wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...7.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
& maximum rack tra: 21.00
Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100
Rack travel in mm : 12.40...12.50
Del. quantity cm3/ : 12.0...12.2
100 s: (11.8...12.4)
Spread cm3 : 0.3
100 s: (0.6)
2nd speed rpm : 400.0
Rack travel in mm : 5.1...5.3
Del. quantity cm3/ : 1.0...1.4
100 s: (0.7...1.6)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Del. quantity : 120.0...122.0
1000 : (118.0...124.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 86...94

Testing:

1st rack travel in: 11.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.60  
5th speed rpm : 400  
Rack travel in m: 12.80...13.30

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 a82  
 Edition : 26.03.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 449CI

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3354421-VERSA028

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 154.6  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...7.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1100

---

Rack travel in mm : 11.70...11.80

---

Del.quantity cm<sup>3</sup>/ : 11.5...11.7

---

100 s: (11.3...11.9)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 400.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.1...1.5  
 100 s: (0.8...1.7)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Del.quantity : 115.0...117.0  
 1000 : (113.0...119.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 85...93

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 525...585

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 500  
Rack travel in m: 11.70...11.90  
5th speed rpm : 400  
Rack travel in m: 12.10...12.60

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

#### APPLICATION

Navy

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P2  
Edition : 27.3.90  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R378-4  
Customer Part-No. : 3 917 033

Customer-specific information  
Customer : CDC

Engine : 4 BT 3.9 IND.

Power k: 59  
Speed 1/mi: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm3/  
1000H.: 58,5...59,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: 7,0

Full-load speed regulation:

Speed 1/min: 1140  
Del.quantity cm3/  
1000H: 45,0...51,0

Start:

Speed 1/min: 110  
Del.quantity : -  
mind cm3/1000H.: 50,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: 1,0...2,4  
2nd speed 1/min: 900  
TD travel mm: 2,3...2,7  
mm: 1,8...2,2  
3rd speed 1/min: 1100  
TD travel mm: 3,1...3,9  
mm: 2,8...4,2

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,3...2,9  
bar: 2,1...3,1  
2nd speed 1/min: 900

Supply-pump pressure bar: 4,1...4,7  
 bar: 3,9...4,9  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 4,9...5,5  
 bar: 4,7...5,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 15...30  
 quantity cm<sup>3</sup>/10s: -  
 2nd speed 1/min: 1100  
 Overflow : 20...50  
 quantity cm<sup>3</sup>/10s: -

Delivery-quant. and breakaway char.:

1st speed 1/min: 1210  
 Del.quantity cm<sup>3</sup>/: 0,00...15,0  
 1000H.: -  
 2nd speed 1/min: 1170  
 Del.quantity cm<sup>3</sup>/: 15,0...55,0  
 1000H.: -  
 3rd speed 1/min: 1140  
 Del.quantity cm<sup>3</sup>/: 45,0...51,0  
 1000H.: 42,0...54,0  
 4th speed 1/min: 1100  
 Del.quantity cm<sup>3</sup>/: 58,0...61,0  
 1000H.: 56,5...62,5  
 5th speed 1/min: 900  
 Del.quantity cm<sup>3</sup>/: 58,5...59,5  
 1000H.: 56,0...62,0  
 6th speed 1/min: 750  
 Del.quantity cm<sup>3</sup>/: 57,5...61,5  
 1000H.: 55,5...63,5  
 7th speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/: 50,0...58,0  
 1000H.: 48,0...60,0

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
 Del.quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/: 0,0...3,0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/: 8,0...14,0  
 1000H.: (6,0...16,0)

2nd speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/: 0,0...4,0  
 1000H.: (-)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Del.quantity cm<sup>3</sup>/: -  
 ind. 1000H.: 80,0

2nd speed 1/min: 240  
 Del.quantity cm<sup>3</sup>/: -  
 max. 1000H.: 80,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 20,0  
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
 K mm : -  
 KF mm : 5,0...5,4  
 MS mm : 1,1...1,5  
 SVS max. mm : 3,5  
 XK mm : -  
 XL mm : -

Remarks:

Heavy-duty fuel-injection pump for  
 DI-engines: only test using timing-  
 device-travel measuring device with  
 metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N24  
 Edition : 31.10.90  
 replaces : -  
 Calibrating oil : ISO 4113  
 Injection pump : VE 4/12F1100 R378-4  
 Type number : 0 460 424 062  
 Customer Part-No. : 3 917 554

Customer-specific information  
 Customer : CDC

Engine : 4 BT 3.9 IND.

Power k: 68  
 Speed 1/mi: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm: 1,8  
 mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

F01

Speed 1/min: 900  
 Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
 Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min : 900  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 67,5...68,5  
 Dispersion cm<sup>3</sup>/: 4,0  
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...15,0  
 Dispersion cm<sup>3</sup>/: 5,5  
 1000H.: 7,0

Full-load speed regulation:

Speed 1/min: 1160  
 Del.quantity cm<sup>3</sup>/  
 1000H: 51,0...57,0

Start:

Speed 1/min: 110  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
 TD travel mm: 1,3...2,1  
 mm: (1,0...2,4)  
 2nd speed 1/min: 900  
 TD travel mm: 2,3...2,7  
 mm: (1,8...2,2)  
 3rd speed 1/min: 1100  
 TD travel mm: 3,1...3,9  
 mm: (2,8...4,2)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 2,3...2,9  
 bar: 2,1...3,1  
 2nd speed 1/min: 900

Supply-pump  
pressure bar: 4,1...4,7  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1230  
Del.quantity cm<sup>3</sup>/: 0,0...1,0  
1000H.: -  
2nd speed 1/min: 1175  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
3rd speed 1/min: 1160  
Del.quantity cm<sup>3</sup>/: 51,0...57,0  
1000H.: (48,0...60,0)  
4th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 65,5...68,5  
1000H.: (64,0...70,0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 67,5...68,5  
1000H.: (65,0...71,0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 70,0...74,0  
1000H.: (68,0...76,0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 74,0...82,0  
1000H.: (72,0...84,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 9,0...15,0  
1000H.: (7,0...17,0)  
2nd speed 1/min: 530

Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 80,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

|          |    |             |
|----------|----|-------------|
| K        | mm | : -         |
| KF       | mm | : 5,0...5,4 |
| MS       | mm | : 1,1...1,5 |
| SVS max. | mm | : 3,5       |
| XK       | mm | : -         |
| XL       | mm | : -         |

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P2  
 Edition : 31.10.90  
 replaces : 14.07.90  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F125D R159-16  
 Type number : 0 460 426 066  
 Customer Part-No. : 3 908 214

Customer-specific information  
 Customer : CDC

Engine : 6 BT 5.9 IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,3  
 (from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
 Piston stroke mm : 1,3  
 mm :  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

F03

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 73,0...74,0  
 Dispersion cm<sup>3</sup>/: 4,0  
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 360  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 8,0...14,0  
 Dispersion cm<sup>3</sup>/: 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 51,0...57,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
 TD travel mm: 1,5...2,3  
 mm: (1,2...2,6)

2nd speed 1/min: 750  
 TD travel mm: 3,4...3,8  
 mm: (2,9...4,3)

3rd speed 1/min: 1100  
 TD travel mm: 5,2...6,0  
 mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 2,4...3,0  
 2nd speed 1/min: 750  
 Supply-pump  
 pressure bar: 3,5...4,1  
 3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 1250  
Overflow quantity cm<sup>3</sup>/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/1000H.: 0,0...3,0  
2nd speed 1/min: 1390  
Del.quantity cm<sup>3</sup>/1000H.: 0,0...15,0  
3rd speed 1/min: 1350  
Del.quantity cm<sup>3</sup>/1000H.: 15,0...55,0  
4th speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/1000H.: 51,0...57,0  
5th speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/1000H.: 70,0...73,0  
6th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/1000H.: 73,0...74,0  
7th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/1000H.: 74,5...78,5  
8th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/1000H.: 76,0...80,0  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/1000H.: 64,0...72,0

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/1000H.: 0..3

Electr. shutoff:

Speed 1/min: 360  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/1000H.: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

Del.quantity cm<sup>3</sup>/1000H.: 8,0...14,0  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/1000H.: 0,0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/ind.: -  
1000H.: 70,0  
2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/max.: -  
1000H.: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,0...5,4  
MS mm : 0,6...1,0  
SVS max. mm : 1,5  
XK mm : 18,8...20,8  
XL mm : 11,1...14,5

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P1  
Edition : 31.10.90  
replaces : 02.11.89  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1250 R159-16  
Type number : 0 460 426 066

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm: 1,3  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. with charge press.:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/  
1000H.: 73,0...74,0  
Dispersion cm<sup>3</sup>/  
1000H : (4,0  
1000H : (4,5)

Low-idle speed regulation:

Speed 1/min: 360  
Del.quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/  
1000H: 51,0...57,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: 3,4...3,8  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1390  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1350  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
4th speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 51,0...57,0  
1000H.: (48,0...60,0)  
5th speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 70,0...73,0  
1000H.: (68,5...74,5)  
6th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 73,0...74,0  
1000H.: (70,5...76,5)  
7th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 74,5...78,5  
1000H.: -  
8th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 76,0...80,0  
1000H.: (74,0...82,0)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 64,0...72,0  
1000H.: (62,0...74,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: -  
1000H.: 0..3

Electr. shutoff:

Speed 1/min: 360  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

F06

Del.quantity cm<sup>3</sup>/: 8,0...14,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 70,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,6...1,0   |
| SVS max. | mm | : 0,9         |
| XK       | mm | : 18,8...20,8 |
| XL       | mm | : 11,8...15,2 |

Remarks:

: C.D.C. # 390 8198  
Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P3  
Edition : 31.10.90  
replaces : 02.11.89  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1250 R159-16  
Type number : 0 460 426 066  
Customer Part-No. : 3 916 114

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,3  
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

F07

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. with charge press.:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/  
1000H.: 73,0...74,0  
Dispersion cm<sup>3</sup> : 4,0  
1000H : (4,5)

Low-idle speed regulation:

Speed 1/min: 360  
Del.quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup> : 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/  
1000H: 51,0...57,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: 3,4...3,8  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1390  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1350  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
4th speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 51,0...57,0  
1000H.: (48,0...60,0)  
5th speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 70,0...73,0  
1000H.: (68,5...74,5)  
6th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 73,0...74,0  
1000H.: (70,5...76,5)  
7th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 74,5...78,5  
1000H.: -  
8th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 76,0...80,0  
1000H.: (74,0...82,0)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 64,0...72,0  
1000H.: (62,0...74,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: -  
1000H.: 0..3

Electr. shutoff:

Speed 1/min: 360  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

F08

Del.quantity cm<sup>3</sup>/: 7,0...15,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 70,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,6...1,0   |
| SVS max. | mm | : 0,9         |
| XK       | mm | : 18,8...20,8 |
| XL       | mm | : 11,8...15,2 |

Remarks:

: C.D.C. # 3 908 198

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S  
Edition : 31.10.90  
replaces : 11.12.86  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R225-4  
Type number : 0 460 426 071

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 027

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm : 1,3  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 71,5...72,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0  
(4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 9,0...15,0  
Dispersion cm<sup>3</sup>/  
1000H.: (7,0

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 54,0...60,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: 3,5...3,9  
mm: (3,0...4,4)  
3rd speed 1/min: 1100  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1260  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 54,0...60,0  
1000H.: (51,0...63,0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 66,5...69,5  
1000H.: (65,0...71,0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 72,0...76,0  
1000H.: (70,0...78,0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 58,0...66,0  
1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 9,0...15,0  
1000H.: (7,0...17,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : 1,0         |
| XK       | mm | : 20,2...22,2 |
| XL       | mm | : 11,5...14,9 |

Remarks:

: C.D.C. # 3 903 367  
Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S1  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1150 R225-4  
Type number : 0 460 426 071  
Customer Part-No. : 3 910 250

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 027

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm : 1,3  
mm :  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 71,5...72,5  
Dispersion cm<sup>3</sup>/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/: 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 50,0...56,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: 3,4...3,8  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 1,5...4,5  
1000H.: -  
2nd speed 1/min: 1220  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 50,0...56,0  
1000H.: (47,0...59,0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 66,5...69,5  
1000H.: (65,0...71,0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 71,0...75,0  
1000H.: (69,0...77,0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 58,0...66,0  
1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8,0...14,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 60,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : 1,0         |
| XK       | mm | : 20,2...22,2 |
| XL       | mm | : 11,5...14,9 |

Remarks:

:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S6  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1150 R225-4  
Type number : 0 460 426 071  
Customer Part-No. : 3 916 115

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 027

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm : 1,3  
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 71,5...72,5  
Dispersion cm<sup>3</sup>/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 9,0...15,0  
Dispersion cm<sup>3</sup>/: 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 54,0...60,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: 3,5...3,9  
mm: (3,0...4,4)  
3rd speed 1/min: 1100  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 1,0...3,0  
1000H.: -  
2nd speed 1/min: 1260  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 54,0...60,0  
1000H.: (51,0...63,0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 66,5...69,5  
1000H.: (65,0...71,0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 72,0...76,0  
1000H.: (70,0...78,0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 58,0...66,0  
1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 9,0...15,0  
1000H.: (7,0...17,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : 1,0         |
| XK       | mm | : 20,2...22,2 |
| XL       | mm | : 11,5...14,9 |

Remarks:

:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S5  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1150 R225-4  
Type number : 0 460 426 071  
Customer Part-No. : 3 916 116

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 027

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm : 1,3  
mm :  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 71,5...72,5  
Dispersion cm<sup>3</sup>/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 9,0...15,0  
Dispersion cm<sup>3</sup>/: 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 54,0...60,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: 3,5...3,9  
mm: (3,0...4,4)  
3rd speed 1/min: 1100  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 1,0...3,0  
1000H.: -  
2nd speed 1/min: 1260  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 54,0...60,0  
1000H.: (51,0...63,0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 66,5...69,5  
1000H.: (65,0...71,0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 72,0...76,0  
1000H.: (70,0...78,0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 58,0...66,0  
1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 9,0...15,0  
1000H.: (7,0...17,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : 1,0         |
| XK       | mm | : 20,2...22,2 |
| XL       | mm | : 11,5...14,9 |

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W70  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R225-22  
Type number : 0 460 426 132  
Customer Part-No. : 3 919 457

Customer-specific information  
Customer : CDC

Engine : 6 BTA

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm : 1,85  
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2,4...2,8

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 3,8...4,4

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/  
1000H.: 92,0...93,0  
Dispersion cm<sup>3</sup>/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 480  
Del.quantity cm<sup>3</sup>/  
1000H.: 11,0...17,0

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H: 15,0...25,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: 2,4...2,8  
mm: (1,9...3,3)  
3rd speed 1/min: 1100  
TD travel mm: 3,0...3,8  
mm: (2,7...4,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,2...2,8  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,2...3,8  
3rd speed 1/min: 900  
Supply-pump  
pressure bar: 3,8...4,4

4th speed 1/min: 1100  
Supply-pump pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1100  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1230  
Del.quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 15,0...25,0  
1000H.: -  
4th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 75,0...78,0  
1000H.: (73,5...79,5)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 80,5...83,5  
1000H.: (78,5...85,5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 92,0...93,0  
1000H.: (89,5...95,5)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 91,0...101,0  
1000H.: (90,0...102,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 480  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 480  
Del.quantity cm<sup>3</sup>/: 11,0...17,0  
1000H.: (9,0...19,0)  
2nd speed 1/min: 550  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,1...5,5   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : 2,2         |
| XK       | mm | : 18,8...20,8 |
| XL       | mm | : 11,9...15,3 |

Remarks:

:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W69  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R225-22  
Type number : 0 460 426 132  
Customer Part-No. : 3 919 458

Customer-specific information  
Customer : CDC

Engine : 6 BTA

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm : 1,85  
mm :  $\pm 0,02(0,06)$

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2,4...2,8

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 3,8...4,4

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/  
1000H.: 92,0...93,0  
Dispersion cm<sup>3</sup>/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 480  
Del.quantity cm<sup>3</sup>/  
1000H.: 11,0...17,0

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 15,0...25,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: 2,4...2,8  
mm: (1,9...3,3)  
3rd speed 1/min: 1100  
TD travel mm: 3,0...3,8  
mm: (2,7...4,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,2...2,8  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,2...3,8  
3rd speed 1/min: 900  
Supply-pump  
pressure bar: 3,8...4,4

4th speed 1/min: 1100  
Supply-pump pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm3/10s: 41...83 (26...98)  
2nd speed 1/min: 1100  
Overflow quantity cm3/10s: 55...138 (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del. quantity cm3/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1230  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1190  
Del. quantity cm3/: 15,0...25,0  
1000H.: -  
4th speed 1/min: 1100  
Del. quantity cm3/: 75,0...78,0  
1000H.: (73,5...79,5)  
5th speed 1/min: 900  
Del. quantity cm3/: 80,5...83,5  
1000H.: (78,5...85,5)  
6th speed 1/min: 750  
Del. quantity cm3/: 92,0...93,0  
1000H.: (89,5...95,5)  
7th speed 1/min: 500  
Del. quantity cm3/: 91,0...101,0  
1000H.: (90,0...102,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del. quantity cm3/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 480  
ELAB volt: -  
Del. quantity cm3/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 480  
Del. quantity cm3/: 11,0..17,0  
1000H.: (9,0...19,0)  
2nd speed 1/min: 550  
Del. quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/: -  
ind. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,1...5,5   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : 2,2         |
| XK       | mm | : 18,8...20,8 |
| XL       | mm | : 11,9...15,3 |

Remarks:

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W72  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1250 R320-2  
Type number : 0 460 426 139  
Customer Part-No. : 3 916 896

Customer-specific information  
Customer : CDC

Engine : 6 BT -5,9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery block  
Piston stroke mm: 1,4  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value mm: 1,3...1,7  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value bar: 6,8...7,4  
KSB solenoid-operated  
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 73,0...74,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup> : 4,0  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 51,0...52,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup> : 9,0  
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del.quantity cm<sup>3</sup>/  
1000H.: 5,5...9,5  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup> : 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340  
Charge press. hPa: 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 52,5...58,5  
KSB solenoid-operated  
valve volt: 12,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0  
KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450\*  
Charge press. hPa: -  
TD travel mm: 3,0...4,0 \*  
mm: -  
KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 1000  
Charge press. hPa: 1200  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1200  
TD travel mm: 1,3...1,7  
mm: (0,8...2,2)  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 1250  
Charge press. hPa: 1200  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 4,1...4,7  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1100  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 6,8...7,4  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 7,5...8,1  
KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250

Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 700  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 68,0...69,0  
1000H.: (64,5...72,5)  
2nd speed 1/min: 1550  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
3rd speed 1/min: 1400  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
4th speed 1/min: 1340  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 52,5...58,5  
1000H.: (49,5...61,5)  
5th speed 1/min: 1250  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 70,5...73,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 1100  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 73,0...74,0  
1000H.: (70,5...76,5)  
7th speed 1/min: 750  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 72,0...77,0  
1000H.: (70,0...79,0)  
8th speed 1/min: 700  
Charge press. hPa: 700  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 68,0...69,0  
1000H.: (64,5...72,5)  
9th speed 1/min: 500  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 51,0...52,0  
1000H.: (47,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 350  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 5,5...9,5  
1000H.: (2,5...12,5)  
2nd speed 1/min: 450  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 70,0

2nd speed 1/min: 250  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 50,0  
Del.quantity cm<sup>3</sup>/: -

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,7

F23

KF mm : K-0T  
MS mm : 0,8...1,2  
SVS max. mm : 1,4

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

\* Correction at adjusting nut (46)

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W71  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1250 R320-2  
Type number : 0 460 426 139  
Customer Part-No. : 3 916 897

Customer-specific information  
Customer : CDC

Engine : 6 BT -5,9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery block  
Piston stroke mm: 1,4  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value mm: 1,3...1,7  
KSB solenoid-operated  
valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value bar: 6,8...7,4  
KSB solenoid-operated  
valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 73,0...74,0  
KSB solenoid-operated  
valve volt: 24,0  
Dispersion cm<sup>3</sup> : 4,0  
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 51,0...52,0  
KSB solenoid-operated  
valve volt: 24,0  
Dispersion cm<sup>3</sup> : 9,0  
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del.quantity cm<sup>3</sup>/  
1000H.: 5,5...9,5  
KSB solenoid-operated  
valve volt: 24,0  
Dispersion cm<sup>3</sup> : 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340  
Charge press. hPa: 1200  
Del.quantity cm<sup>3</sup>/  
1000H: 52,5...58,5  
KSB solenoid-operated  
valve volt: 24,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0  
KSB solenoid-operated  
valve volt: 24,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450\*  
Charge press. hPa: -  
TD travel mm: 3,0...4,0 \*  
mm: -

KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 1000  
Charge press. hPa: 1200  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)

KSB solenoid-operated  
valve volt: 24,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1200  
TD travel mm: 1,3...1,7  
mm: (0,8...2,2)

KSB solenoid-operated  
valve volt: 24,0  
4th speed 1/min: 1250  
Charge press. hPa: 1200  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)

KSB solenoid-operated  
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 4,1...4,7

KSB solenoid-operated  
valve volt: 24,0

2nd speed 1/min: 1100  
Charge press. hPa: 1200

Supply-pump  
pressure bar: 6,8...7,4

KSB solenoid-operated  
valve volt: 24,0

3rd speed 1/min: 1250  
Charge press. hPa: 1200

Supply-pump  
pressure bar: 7,5...8,1

KSB solenoid-operated  
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250

Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 700  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 68,0...69,0  
1000H.: (64,5...72,5)

2nd speed 1/min: 1550  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 0,0...3,0  
1000H.: -

3rd speed 1/min: 1400  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 15,0...55,0  
1000H.: -

4th speed 1/min: 1340  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 52,5...58,5  
1000H.: (49,5...61,5)

5th speed 1/min: 1250  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 70,5...73,5  
1000H.: (69,0...75,0)

6th speed 1/min: 1100  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 73,0...74,0  
1000H.: (70,5...76,5)

7th speed 1/min: 750  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 72,0...77,0  
1000H.: (70,0...79,0)

8th speed 1/min: 700  
Charge press. hPa: 700  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>: 68,0...69,0  
1000H.: (64,5...72,5)

9th speed 1/min: 500  
Charge press. hPa: -

KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 51,0...52,0  
1000H: (47,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 350  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 5,5...9,5  
1000H.: (2,5...12,5)

2nd speed 1/min: 450  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 250  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 50,0  
Del.quantity cm<sup>3</sup>/: -

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
K mm : 3,7

KF mm : K-OT  
MS mm : 0,8...1,2  
SVS max. mm : 1,4

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

\* Correction at adjusting nut (46)

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Unscrew KSB ball valve 2 mm

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W73  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1250 R320-2  
Type number : 0 460 426 139  
Customer Part-No. : 3 916 992

Customer-specific information  
Customer : CDC

Engine : 6 BT -5,9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery block  
Piston stroke mm: 1,4  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value mm: 1,3...1,7  
KSB solenoid-operated  
valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value bar: 6,8...7,4  
KSB solenoid-operated  
valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 73,0...74,0  
KSB solenoid-operated  
valve volt: 24,0  
Dispersion cm<sup>3</sup> : 4,0  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 51,0...52,0  
KSB solenoid-operated  
valve volt: 24,0  
Dispersion cm<sup>3</sup> : 9,0  
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del.quantity cm<sup>3</sup>/  
1000H.: 5,5...9,5  
KSB solenoid-operated  
valve volt: 24,0  
Dispersion cm<sup>3</sup> : 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340  
Charge press. hPa: 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 52,5...58,5  
KSB solenoid-operated  
valve volt: 24,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0  
KSB solenoid-operated  
valve volt: 24,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450\*  
Charge press. hPa: -  
TD travel mm: 3,0...4,0 \*  
mm: -  
KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 1000  
Charge press. hPa: 1200  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)  
KSB solenoid-operated  
valve volt: 24,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1200  
TD travel mm: 1,3...1,7  
mm: (0,8...2,2)  
KSB solenoid-operated  
valve volt: 24,0  
4th speed 1/min: 1250  
Charge press. hPa: 1200  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)  
KSB solenoid-operated  
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 4,1...4,7  
KSB solenoid-operated  
valve volt: 24,0  
2nd speed 1/min: 1100  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 6,8...7,4  
KSB solenoid-operated  
valve volt: 24,0  
3rd speed 1/min: 1250  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 7,5...8,1  
KSB solenoid-operated  
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250

Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 700  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 68,0...69,0  
1000H.: (64,5...72,5)  
2nd speed 1/min: 1550  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
3rd speed 1/min: 1400  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
4th speed 1/min: 1340  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 52,5...58,5  
1000H.: (49,5...61,5)  
5th speed 1/min: 1250  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 70,5...73,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 1100  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 73,0...74,0  
1000H.: (70,5...76,5)  
7th speed 1/min: 750  
Charge press. hPa: 1200  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 72,0...77,0  
1000H.: (70,0...79,0)  
8th speed 1/min: 700  
Charge press. hPa: 700  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 68,0...69,0  
1000H.: (64,5...72,5)  
9th speed 1/min: 500  
Charge press. hPa: -



KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 51,0...52,0  
1000H: (47,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 350  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 5,5...9,5  
1000H.: (2,5...12,5)

2nd speed 1/min: 450  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 250  
Charge press. hPa: -  
KSB solenoid-operated  
valve volt: 24,0  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H: 50,0  
Del.quantity cm<sup>3</sup>/: -

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
K mm : 3,7

KF mm : K-0T  
MS mm : 0,8...1,2  
SVS max. mm : 1,4

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

\* Correction at adjusting nut (46)

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U38  
Edition : 31.10.90  
replaces : 12.07.89  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R225-23  
Type number : 0 460 426 143

Customer-specific information  
Customer : CDC

Engine : 6 BT -5,9 IN

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +0,02(0,04)

Start of delivery block  
Piston stroke mm : 1,3  
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 71,5...72,5  
Dispersion cm<sup>3</sup>/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8,0...14,00  
Dispersion cm<sup>3</sup>/: 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 50,0...56,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)

2nd speed 1/min: 750  
TD travel mm: 3,4...3,8  
mm: (2,9...4,3)

3rd speed 1/min: 1100  
TD travel mm: 5,5...6,3  
mm: (5,2...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1220  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 50,0...56,0  
1000H.: (47,0...59,0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 66,5...69,5  
1000H.: (65,0...71,0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 55,5...64,5  
1000H.: =

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8,0...14,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 60,0

3rd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : -           |
| XK       | mm | : 20,2...22,2 |
| XL       | mm | : 11,5...14,9 |

Remarks:

: C.D.C. # 391 6949  
Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U49  
Edition : 31.10.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1150 R225-23  
Type number : 0 460 426 143  
Customer Part-No. : 3 916 950

Customer-specific information  
Customer : CDC

Engine : 6 BT -5,9 IN

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm: 1,3  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

G04

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 71,5...72,5  
Dispersion cm<sup>3</sup>/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8,0...14,00  
Dispersion cm<sup>3</sup>/: 5,5  
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 50,0...56,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: 3,4...3,8  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,5...6,3  
mm: (5,2...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1220  
Del.quantity cm<sup>3</sup>/: 15,0...55,0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 50,0...56,0  
1000H.: (47,0...59,0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 66,5...69,5  
1000H.: (65,0...71,0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 71,5...72,5  
1000H.: (69,0...75,0)  
6th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 55,5...64,5  
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8,0...14,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 60,0

3rd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

|          |    |               |
|----------|----|---------------|
| K        | mm | : -           |
| KF       | mm | : 5,0...5,4   |
| MS       | mm | : 0,8...1,2   |
| SVS max. | mm | : -           |
| XK       | mm | : 20,2...22,2 |
| XL       | mm | : 11,5...14,9 |

Remarks:

:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RAB 9,7 b 1  
 Edition : 28.11.90  
 Replaces : 11.11.88  
 Test oil : ISO-4113

Combination no. : 0 400 846 543

Injection pump  
 Pump designation : PES6A95D420LS2595  
 EP type number : 0 410 896 930  
 Governor  
 Governor design. : RQ200/1100AB1210R  
 Governor no. : 0 420 201 643

Customer spec. information  
 Customer : RABA

Engine : D2156MT6U

1st version kW : 188.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 200.0

Rack travel in mm : 7.3...7.5

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.60

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 126.5...128.5

1000 : (124.5...130.5)

Spread cm<sup>3</sup> : 3.00

1000 : (6.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 19.9

Testing:

1st rack travel in: 11.60

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1190...1220

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 200  
Rack travel in mm : 6.4

Testing:

Speed rpm : 100  
Minimum rack trave: 7.60  
Speed rpm : 200  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 320...360  
Speed rpm : 450  
Maximum rack trave: 1.00

TORQUE CONTROL

Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 600  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 865  
Rack travel in m: 13.40...13.70  
4th speed rpm : 985  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : 340  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 250  
Rack travel in m: 11.20...11.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm3/ : 135.0...138.0  
1000 s: (133.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 82.5...84.5  
1000 s: (80.5...86.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 177.0...187.0  
1000 s: (174.0...190.0)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

Set idle stop at 200 min -1 to a  
control-rod travel of 6.4 mm

APPLICATION

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 12,2 i  
 Edition : 16.11.90  
 Replaces : 29.6.90  
 Test oil : ISO-4113

Combination no. : 0 401 846 923

Injection pump  
 Pump designation : PE6P120A320RS3118  
 EP type number : 0 411 826 726  
 Governor  
 Governor design. : RQV250...1100PA920-6  
 Governor no. : 0 421 813 872

Customer-spec. information  
 Customer : VOLVO-TRUCK

Engine : THD 102 KD

1st version kW : 250.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70  
 : (2.55...2.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 13.30...13.40

Del.quantity cm<sup>3</sup>/ : 22.2...22.4

100 s: (21.9...22.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 5.1...5.3  
 Del.quantity cm<sup>3</sup>/ : 2.9...3.5  
 100 s: (2.6...3.8)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.00...1.40  
 2nd speed rpm : 500  
 travel mm : 4.10...4.70  
 3rd speed rpm : 800  
 travel mm : 6.30...6.70  
 4th speed rpm : 1140  
 travel mm : 7.70...7.90  
 5th speed rpm : 1230  
 travel mm : 9.00...9.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1175  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200



Del.quantity : 222.0...224.0  
1000 : (219.0...227.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

#### Testing:

1st rack travel in: 12.30  
Speed rpm : 1130...1140  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 60...68

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 250  
Rack travel in mm : 5.10...5.30

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.30...13.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 150  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 770  
Rack travel in m: 12.90...13.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 133.0...135.0  
1000 s: (130.0...138.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 230.0...270.0  
1000 s: (225.0...275.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 29.0...35.0  
1000 s: (26.0...38.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAN 11,9 q  
 Edition : 06.07.90  
 Replaces : 30.3.90  
 Test oil : ISO-4113

Combination no. : 0 402 036 734

Injection pump  
 Pump designation : PES6P120A720/3LS3247  
 EP type number : 0 412 026 735  
 Governor  
 Governor design. : RG300/1100PA813-12  
 Governor no. : 0 421 801 518

Customer-spec. information  
 Customer : MAN

Engine : D2866LXF/A00

1st version kW : 273.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 5.90...6.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.00...4.00

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 15.00...15.10

---

Del. quantity cm<sup>3</sup>/ : 24.2...24.4

---

100 s: (23.9...24.7)

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.8...5.2  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2

Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del. quantity : 242.0...244.0  
 1000 : (239.0...247.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.70  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

Testing:

Speed rpm : 200  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 700  
Rack travel in m: 15.00...15.10  
3rd speed rpm : 900  
Rack travel in m: 14.80...15.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 14.00...14.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1100  
Del.quantity cm3/ : 230.0...236.0  
1000 s: (227.0...239.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 95.0...101.0  
1000 s: (92.0...104.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.70  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7889

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 11,9 r1  
 Edition : 05.11.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 036 735X

Injection pump  
 Pump designation : PES6P120A720/3LS3250  
 -1  
 EP type number : 0 412 026 742  
 Governor  
 Governor design. : RQ300/1000PA813-13  
 Governor no. : 0 421 801 529

Cust. part no. : 3-7050X

Customer-spec. information  
 Customer : MAN

Engine : D2866LX

1st version kW : 265.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6-2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 13.30...13.40

---

Del.quantity cm<sup>3</sup>/ : 24.2...24.4

---

100 s: (23.9...24.7)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.1...4.3  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 650  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 242.0...244.0  
 1000 : (239.0...247.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 650  
 Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.70  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30  
Rack travel in mm : 2.00  
Speed rpm : 330...370

#### TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 700  
Rack travel in m: 13.50...13.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 110  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 470  
Rack travel in m: 11.90...12.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1000

Del.quantity cm3/ : 236.0...242.0  
1000 s: (233.0...245.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.10...4.30  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 11,9 u4  
 Edition : 30.11.90  
 Replaces : 31.7.90  
 Test oil : ISO-4113

Combination no. : 0 402 036 742

Injection pump  
 Pump designation : PES6P120A720/3LS3255  
 EP type number : 0 412 026 739  
 Governor  
 Governor design. : RQ300/1100PA813-7  
 Governor no. : 0 421 801 474

Customer-spec. information  
 Customer : MAN

Engine : D2866LF01

1st version kW : 273.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 5.90...6.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.00...4.00

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 15.00...15.10

---

Del.quantity cm<sup>3</sup>/ : 24.2...24.4

---

100 s: (23.9...24.7)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 300.0

Rack travel in mm : 5.0...5.4

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2

Speed rpm : 650

Rack travel in mm : 16.00...17.60

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 650  
Rack travel in mm : 16.8

Testing:

1st rack travel in: 13.80  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 400...440

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 700  
Rack travel in m: 15.80...16.00  
3rd speed rpm : 900  
Rack travel in m: 15.10...15.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 14.00...14.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

G15

1st version

Aneroid pressure h: 1200  
Speed rpm : 1100  
Del.quantity cm3/ : 230.0...236.0  
1000 s: (227.0...239.0)  
Speed rpm : 700  
Del.quantity cm3/ : 90.0...100.0  
1000 s: (87.0...103.0)  
Spread cm3 : 10.00  
1000 s: (-)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7946

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 9,8 k  
 Edition : 30.11.90  
 Replaces : 20.7.90  
 Test oil : ISO-4113

Combination no. : 0 402 046 340

Injection pump  
 Pump designation : PES6P120A32ORS525  
 EP type number : 0 412 026 058  
 Governor  
 Governor design. : RQV300...1050PA955  
 Governor no. : 0 421 813 856

Customer-spec. information  
 Customer : RVI

Engine : MIDS062045J

1st version kW : 160.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 9.40...9.50

---

Del.quantity cm<sup>3</sup>/ : 13.8...14.0  
 100 s: (13.5...14.3)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.3...5.7  
 Del.quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s: (1.2...2.4)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1050  
 travel mm : 8.00...8.20

2nd speed rpm : 300  
 travel mm : 1.10...1.50

3rd speed rpm : 430  
 travel mm : 3.40...4.00

4th speed rpm : 1400  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1

Speed rpm : 1075  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1050  
 Del.quantity : 138.0...140.0  
 1000 : (135.0...143.0)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 298...306

Testing:  
1st rack travel in: 8.40  
Speed rpm : 1130...1140  
2nd rack travel in: 4.20  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 244...252

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 310...430

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 126.0...134.0  
1000 s: (123.0...137.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.40  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.30...5.70  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.0...24.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 b 1  
 Edition : 15.08.89  
 Replaces : 16.12.88  
 Test oil : ISO-4113

Combination no. : 0 402 046 788

Injection pump  
 Pump designation : PES6P110A32ORS3190  
 EP type number : 0 412 016 720  
 Governor  
 Governor design. : RQV275...1175PA833-3  
 Governor no. : 0 421 813 656

Customer-spec. information  
 Customer : RVI

Engine : MIDR 060226D

1st version kW : 151.0  
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30  
 : (4.15...4.35)  
 Rack travel in mm : 18.00...21.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1175  


---

 Rack travel in mm : 13.40...13.50  


---

 Del. quantity cm<sup>3</sup>/ : 11.6...11.9  
 100 s: (11.3...12.1)  


---

 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)  


---

 2nd speed rpm : 275.0  
 Rack travel in mm : 4.6...5.0  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.2  
 100 s: (2.4...3.4)  
 Spread cms : 0.4  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.10  
 2nd speed rpm : 450  
 travel mm : 3.40...3.80  
 3rd speed rpm : 800  
 travel mm : 5.10...5.50  
 4th speed rpm : 1175  
 travel mm : 7.20...7.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1330  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1175  
 Aneroid pressure h: 1000  
 Del. quantity : 116.0...119.0  
 1000 : (113.5...121.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 250...320

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 400  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 160  
Rack travel in m: 10.80...11.20

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 111.5...116.5  
1000 s: (108.5...119.5)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 47.5...50.5  
1000 s: (45.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (86.0...114.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 27.0...32.0  
1000 s: (24.5...34.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : RVI 12,0 f2  
 Edition : 22.11.90  
 Replaces : 5.11.90  
 Test oil : ISO-4113

Combination no. : 0 402 046 791

Injection pump  
 Pump designation : PES6P120A32ORS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...950PA728-4  
 Governor no. : 0 421 813 678

Customer-spec. information  
 Customer : RVI

Engine : MIDR 063540 H

1st version kW : 264.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 13.30...13.40

Del.quantity cm<sup>3</sup>/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.60...6.00

Del.quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 275  
 travel mm : 1.30...1.70

2nd speed rpm : 450  
 travel mm : 3.30...3.70

3rd speed rpm : 800  
 travel mm : 5.60...6.00

4th speed rpm : 950  
 travel mm : 6.70...6.90

5th speed rpm : 1500  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 212.0...214.0

1000 : (209.0...217.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 12.30  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 65...73

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 275  
Rack travel in mm : 5.70...5.90

#### CONSTANT REGULATION

Speed rpm : 295...400

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.50  
2nd pressure hPa : 660  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 200  
Rack travel in m: 10.20...10.40

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 210.0...216.0  
1000 s: (207.0...219.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 117.0...119.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 6,2 f  
 Edition : 30.11.90  
 Replaces : 9.11.89  
 Test oil : ISO-4113

Combination no. : 0 402 046 811

Injection pump  
 Pump designation : PES6P110A32ORS3233  
 EP type number : 0 412 016 728  
 Governor  
 Governor design. : RQV275...1175PA833-4  
 Governor no. : 0 421 813 762

Customer-spec. information  
 Customer : RVI

Engine : MIDR 060226D

1st version kW : 166.0  
 Rated speed : 2350

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30  
 : (4.15...4.35)  
 Rack travel in mm : 18.00...21.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1175

---

Rack travel in mm : 13.50...13.60

---

Del.quantity cm<sup>3</sup>/ : 11.7...12.0

---

100 s: (11.4...12.2)

---

Spread cm<sup>3</sup> : 0.4

---

100 s: (0.7)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 4.80...5.00  
 Del.quantity cm<sup>3</sup>/ : 2.8...3.3  
 100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 0.40...0.60  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 800  
 travel mm : 4.60...5.00  
 4th speed rpm : 1175  
 travel mm : 6.90...7.10

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1330  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1175  
 Aneroid pressure h: 1000  
 Del.quantity : 117.0...120.0  
 1000 : (114.5...122.5)

Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:

1st rack travel in: 12.50  
Speed rpm : 1255...1265  
2nd rack travel in: 4.00  
Speed rpm : 1410...1440  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 80...88

Testing:

Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 275  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 250...320

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.50...13.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.60  
2nd pressure hPa : 400  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 160  
Rack travel in m: 10.50...10.90

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 113.5...118.5  
1000 s: (110.5...121.5)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 49.5...52.5  
1000 s: (47.0...55.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1255...1265

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 85.0...105.0  
1000 s: (81.0...109.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 28.0...33.0  
1000 s: (25.5...35.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 e1  
 Edition : 05.11.90  
 Replaces : 14.9.90  
 Test oil : ISO-4113

Combination no. : 0 402 640 818

Injection pump  
 Pump designation : PE12P120A520LS7829  
 EP type number : 0 412 620 821  
 Governor  
 Governor design. : RQV300...1150PA943-1  
 Governor no. : 0 421 813 869

Customer-spec. information  
 Customer : MAN

Engine : D2842LZE

1st version kW : 809.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150

---

Rack travel in mm : 13.80...13.90

---

Del. quantity cm<sup>3</sup>/ : 30.4...30.6  
 100 s: (30.1...30.9)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 500.0  
 Rack travel in mm : 9.00...9.20  
 Del. quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s: (14.6...15.4)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

3rd speed rpm : 300  
 Rack travel in mm : 7.30...7.50  
 Del. quantity cm<sup>3</sup>/ : 5.2...6.0 \*  
 100 s: (-)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.60

2nd speed rpm : 450  
 travel mm : 2.90...3.50

3rd speed rpm : 750  
 travel mm : 5.70...6.10

4th speed rpm : 1150  
 travel mm : 9.50...9.70

5th speed rpm : 1400  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1225  
 Rack travel in mm : 15.20...17.80



FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 304.0...306.0  
1000 : (301.0...309.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 12.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 76...84

Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 300  
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION

Speed rpm : 280...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 100  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 470  
Rack travel in m: 12.40...12.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 17.50

HIGH IDLE

1st version

Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)

2nd version

Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm<sup>3</sup>/ : < 50.0  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.50...8.70  
Del.quantity cm<sup>3</sup>/ : 125.0  
1000 s: (-)

Remarks:

: MAN-NR. 3-7023

\* applies to cylinders 4, 5, 6, 8, 10  
and 12  
\*\* applies for cylinders 1, 2, 3, 7, 9

and 11

APPLICATION

Ship



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 21,9 x 2  
 Edition : 19.10.90  
 Replaces : 14.9.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 640 819  
  
 Injection pump  
 Pump designation : PE12P120A320LS7807-3  
 EP type number : 0 412 620 822  
 Governor  
 Governor design. : RQV350...1050PA842-6  
 Governor no. : 0 421 813 853

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 390.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 : 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.50...13.70

Del. quantity cm<sup>3</sup>/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...5.6  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 0.70...1.20

2nd speed rpm : 600  
 travel mm : 3.10...3.60

3rd speed rpm : 940  
 travel mm : 5.20...5.70

4th speed rpm : 1105  
 travel mm : 6.70...7.20

5th speed rpm : 1263  
 travel mm : 9.80...10.30

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 660  
Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 107...115

Testing:

1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 62...70

Testing:

Speed rpm : 250  
Minimum rack trave: 7.10  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 400...600

TORQUE CONTROL

Dimension a mm : 1.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.40  
2nd speed rpm : 975  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 875  
Rack travel in m: 13.20...13.40  
4th speed rpm : 700  
Rack travel in m: 13.50...13.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 660  
Rack travel mm : 13.50...13.70

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : -  
Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm3/ : 170.0...174.0  
1000 s: (167.0...177.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm3/ : 204.0...208.0  
1000 s: (201.0...211.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm3/ : 150.0...154.0  
1000 s: (147.0...157.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 22,0 e  
 Edition : 19.10.90  
 Replaces : 20.7.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 640 820  
  
 Injection pump  
 Pump designation : PE12P120A320LS7814-2  
 EP type number : 0 412 620 824  
 Governor  
 Governor design. : RQ750PA966  
 Governor no. : 0 421 801 535

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 535.0  
 Rated speed : 1500

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

### BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.90...15.00

Del. quantity cm<sup>3</sup>/ : 31.6...31.8

100 s: (31.3...32.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.6...5.2  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 750  
 travel mm : 1.00...1.50

2nd speed rpm : 791  
 travel mm : 4.30...4.80

3rd speed rpm : 850  
 travel mm : 11.10...11.60

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 316.0...318.0  
 1000 : (313.0...321.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

### RATED SPEED

1st version  
Control lever  
position degrees: 76...84

Testing:  
1st rack travel in: 13.90  
Speed rpm : 755...760  
2nd rack travel in: 4.00  
Speed rpm : 785...795

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 755...760

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 22,0 a 1  
Edition : 17.10.90  
Replaces : 31.7.90  
Test oil : ISO-4113

Combination no. : 0 402 640 821

Injection pump  
Pump designation : PE12P120A520LS7814  
EP type number : 0 412 620 813  
Governor  
Governor design. : RQV350...1050PA870-9  
Governor no. : 0 421 813 873

## Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 588.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 19.00...21.00  
Firing order : 12- 1- 5- 9- 8- 3-  
4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 13.00...13.20

Del. quantity cm<sup>3</sup>/ : 26.2...26.5

100 s: (25.9...26.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.30...1.80

2nd speed rpm : 600  
travel mm : 3.30...3.80

3rd speed rpm : 900  
travel mm : 5.40...5.90

4th speed rpm : 1100  
travel mm : 7.60...8.10

5th speed rpm : 1200  
travel mm : 9.60...10.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650  
Aneroid pressure h : 1100  
Del.quantity : 262.0...265.0  
1000 : (259.0...268.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control Lever  
position degrees: 113...121

Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 62...70

Testing:

Speed rpm : 250  
Minimum rack trave: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.30...5.90

CONSTANT REGULATION

Speed rpm : 350...600

TORQUE CONTROL

Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 850  
Rack travel in m: 13.70...13.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 650  
Pressure hPa : 1100  
Rack travel mm : 13.00...13.20

Measurement

Speed 1/min : 650

1st pressure hPa : 500  
Rack travel in m: 9.50...9.70

H05

2nd pressure hPa : 700  
Rack travel in m: 11.10...11.30  
3rd pressure hPa : 1400  
Rack travel in m: 13.20...13.30  
4th pressure hPa : 1500  
Rack travel in m: 13.40...13.60  
5th pressure hPa : -  
Rack travel in m: 8.20...8.50

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1050  
Del.quantity cm3/ : 261.0...264.0  
1000 s: (258.0...267.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1850  
~~Speed~~ rpm : 750  
Del.quantity cm3/ : 278.0...282.0  
1000 s: (275.0...285.0)  
Spread cm3 : -  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 22,0 e 2  
 Edition : 17.10.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 640 822

Injection pump  
 Pump designation : PE12P120A320LS7814-2  
 EP type number : 0 412 620 824  
 Governor  
 Governor design. : RG900PA966-1  
 Governor no. : 0 421 801 550

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 539.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 14.50...14.60

Del.quantity cm<sup>3</sup>/ : 29.4...29.6

100 s: (29.1...29.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 935

travel mm : 4.60...5.10

2nd speed rpm : 1070

travel mm : 13.70...14.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Del.quantity : 294.0...296.0

1000 : (291.0...299.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 77...85

Testing:

1st rack travel in: 13.50  
Speed rpm : 905...910  
2nd rack travel in: 4.00  
Speed rpm : 940...950  
4th rack travel in: 1000  
Speed rpm : 0.00...1.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 905...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 f  
 Edition : 23.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 824  
 Injection pump  
 Pump designation : PE12P120A520LS7824-1  
 EP type number : 0 412 620 825  
 Governor  
 Governor design. : RGV250...1150PA977K  
 Governor no. : 0 421 815 265

Customer-spec. information  
 Customer : MAN

Engine : D2842LXF

1st version kW : 735.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 13.70...13.80  
 Del.quantity cm<sup>3</sup>/ : 30.8...31.0  
 100 s : (30.5...31.3)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.0...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s : (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 1195  
 travel mm : 10.10...10.30  
 2nd speed rpm : 300  
 travel mm : 1.00...1.20  
 3rd speed rpm : 550  
 travel mm : 3.40...4.00  
 4th speed rpm : 900  
 travel mm : 7.00...7.40  
 5th speed rpm : 1450  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1215  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 308.0...310.0  
1000 : (305.0...313.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 295...303

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 246...254

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 330...450

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 700  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 900  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 1300  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 8.50...8.70  
2nd pressure hPa : 250

Rack travel in m: 8.90...9.00  
3rd pressure hPa : 650  
Rack travel in m: 10.80...11.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1300  
Speed rpm : 700  
Del.quantity cm3/ : 256.0...262.0  
1000 s: (253.0...265.0)  
Aneroid pressure h: 1300  
Speed rpm : 900  
Del.quantity cm3/ : 285.0...291.0  
1000 s: (282.0...294.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 141.0...143.0  
1000 s: (138.0...146.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 255.0...275.0  
1000 s: (251.0...279.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MAN-NR. 3-7024

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11,0 t  
 Edition : 30.11.90  
 Replaces : 16.2.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 646 838  
  
 Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/1050PA762-4  
 Governor no. : 0 421 801 390

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 240.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del. quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del. quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 1050  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 800  
Rack travel in m: 15.10...15.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.90  
3rd pressure hPa : 1050  
Rack travel in m: 14.00...14.10 \*  
4th pressure hPa : 1150  
Rack travel in m: 14.40...14.70  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350  
Speed rpm : 1050  
Del.quantity cm3/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.70  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 11,1 m  
 Edition : 16.11.90  
 Replaces : 5.3.90  
 Test oil : ISO-4113

Combination no. : 0 402 646 872

Injection pump  
 Pump designation : PE6P120A72ORS7126Z  
 EP type number : 0 412 626 830  
 Governor  
 Governor design. : RQV200...1000PA725-6  
 Governor no. : 0 421 813 755

Customer spec. information  
 Customer : SAAB-SCANIA

Engine : DSC11 08

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 20.4...20.6

100 s: (20.1...20.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.40...3.00  
 3rd speed rpm : 650  
 travel mm : 4.40...5.00  
 4th speed rpm : 1045  
 travel mm : 8.40...8.60  
 5th speed rpm : 1150  
 travel mm : 9.70...10.10

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1170  
 Rack travel in mm : 6.00...12.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 204.0...206.0  
 1000 : (201.0...209.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 350...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.80...12.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 470  
Rack travel in m: 12.40...12.50  
3rd pressure hPa : 320  
Rack travel in m: 11.20...11.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 197.0...205.0  
1000 s: (195.0...207.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (-)  
Rack travel in mm : 10.30...10.70

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 9° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11,0 t 3  
 Edition : 05.11.90  
 Replaces : 20.10.89  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 646 888  
  
 Injection pump  
 Pump designation : PE6P120A32DLS7808-2  
 EP type number : 0 412 626 833  
 Governor  
 Governor design. : RQV350..1050PA842-4  
 Governor no. : 0 421 813 806

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM441 LA

1st version kW : 243.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 025  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 100...120  
  
 Test nozzle holder  
 assembly : 1 688 901 019  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,8  
  
 Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6-3-5-2-4-1  
  
 Phasing : 0-60-120-180-240-300  
  
 Tolerance + - ° : 0.50 (0.75)  
  
 Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600  


---

 Rack travel in mm : 14.10...14.30  


---

 Del. quantity cm<sup>3</sup>/ : 22.0...22.2  
 100 s: (21.7...22.5)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  


---

 2nd speed rpm : 350.0  
 Rack travel in mm : 5.1...5.7  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.40...1.60  
 2nd speed rpm : 800  
 travel mm : 3.90...4.30  
 3rd speed rpm : 1100  
 travel mm : 6.80...7.20  
 4th speed rpm : 1200  
 travel mm : 8.50...9.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1185  
 Rack travel in mm : 16.50...18.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600

Aneroid pressure h: 900  
Del.quantity : 220.0...222.0  
1000 : (217.0...225.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

#### Testing:

1st rack travel in: 13.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 63...71

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

#### CONSTANT REGULATION

Speed rpm : 350...600

#### TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 1000  
Rack travel in m: 15.10...15.30  
4th speed rpm : 985  
Rack travel in m: 15.30...15.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.10...14.30

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 600  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1250

Rack travel in m: 14.30...14.50  
4th pressure hPa : 1350  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 242.0...246.0  
1000 s: (239.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF 11,7 k1  
 Edition : 16.11.90  
 Replaces : 12.4.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 894  
 Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQ250/1000PA936  
 Governor no. : 0 421 801 507

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850  
 Rack travel in mm : 13.70...13.80  
 Del.quantity cm3/ : 23.9...24.1  
 100 s: (23.6...24.4)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 7.6...8.0  
 Del.quantity cm3/ : 2.2...2.8  
 100 s: (1.9...3.1)  
 Spread cm3 : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 550  
 Rack travel in mm : 15.20...16.40

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del.quantity : 239.0...241.0  
 1000 : (236.0...244.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 15.8

Testing:  
 1st rack travel in: 12.70

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 250  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 345...385

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1000  
Rack travel in m: 13.90...14.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 600  
1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 165.0...167.0  
1000 s: (162.0...170.0)

#### BREAKAWAY

#### 1st version

H17

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...6.80

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF 11,7 k4  
 Edition : 16.11.90  
 Replaces : 17.5.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 896  
 Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RGV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del.quantity cm<sup>3</sup>/ : 2.2...2.8

100 s: (1.9...3.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 2.40...3.20

3rd speed rpm : 800  
 travel mm : 5.20...5.60

4th speed rpm : 1000  
 travel mm : 7.30...7.50

5th speed rpm : 1300  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 239.0...241.0  
1000 : (236.0...244.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 12.70  
Speed rpm : 1025...1040  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 81...89

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 250  
Rack travel in mm : 6.60...6.80

#### CONSTANT REGULATION

Speed rpm : 275...385

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 165.0...167.0  
1000 s: (162.0...170.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1025...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...6.80

#### Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 13,8 w  
 Edition : 30.11.90  
 Replaces : 21.9.90  
 Test oil : ISO-4113

Combination no. : 0 402 646 902

Injection pump  
 Pump designation : PE6P130A72ORS7197  
 EP type number : 0 412 636 815  
 Governor  
 Governor design. : RQV300...900PA946  
 Governor no. : 0 421 813 845

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42.151

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

H20

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

---

Rack travel in mm : 13.50...13.60

---

Del.quantity cm<sup>3</sup>/ : 25.5...25.8

---

100 s: (25.1...26.1)

---

Spread cm<sup>3</sup> : 0.6

---

100 s: (1.0)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.1...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s: (1.5...2.9)

Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.40

3rd speed rpm : 700  
 travel mm : 5.50...5.90

4th speed rpm : 900  
 travel mm : 7.70...7.90

5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 970  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 255.0...258.0  
 1000 : (251.5...261.5)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 12.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 76...84

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 300  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 320...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 345  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 275  
Rack travel in m: 11.10...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 269.0...276.0  
1000 s: (269.0...276.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 181.0...184.0  
1000 s: (177.5...187.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...280.0  
1000 s: (236.0...284.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 b3  
Edition : 15.11.90  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 903  
Injection pump  
Pump designation : PE6P12DA72ORS7126  
EP type number : 0 412 626 815  
Governor  
Governor design. : RQV200...1000PA725-8  
Governor no. : 0 421 813 885

Customer spec. information  
Customer : SCANIA

Engine : D5C11 30

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 019  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test lines : 1 680 750 015  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.20...14.30

Del. quantity cm<sup>3</sup>/ : 24.0...24.2

100 s: (23.7...24.5)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0  
Rack travel in mm : 4.7...5.1  
Del. quantity cm<sup>3</sup>/ : 1.8...2.2  
100 s: (-)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 1.20...1.60  
2nd speed rpm : 350  
travel mm : 2.40...3.00  
3rd speed rpm : 650  
travel mm : 4.40...5.00  
4th speed rpm : 1045  
travel mm : 8.40...8.60  
5th speed rpm : 1150  
travel mm : 9.70...10.10

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1170  
Rack travel in mm : 6.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700  
Aneroid pressure h: 900  
Del. quantity : 240.0...242.0  
1000 : (237.0...245.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 350...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.20...14.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 470  
Rack travel in m: 13.20...13.30  
3rd pressure hPa : 225  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 226.0...234.0  
1000 s: (224.0...236.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (-)  
Rack travel in mm : 10.30...10.70

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 11,0 t 7  
 Edition : 16.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113

Combination no. : 0 402 646 908

Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/950PA932-3  
 Governor no. : 0 421 801 528

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 249.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack trave: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 550  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1100  
Rack travel in m: 14.10...14.20  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 9.40...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm3/ : 241.0...243.0  
1000 s: (238.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm3/ : 239.0...244.0  
1000 s: (236.0...247.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 13.00...13.50

Remarks:

:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF 11,7 L  
 Edition : 16.11.90  
 Replaces : 20.7.90  
 Test oil : ISO-4113

Combination no. : 0 402 646 912

Injection pump  
 Pump designation : P6P120A32ORS7218  
 EP type number : 0 412 626 839  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 105

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

**BASIC SETTING**

1st speed rpm : 850

---

Rack travel in mm : 15.00...15.10

---

Del. quantity cm<sup>3</sup>/ : 23.5...23.7

---

100 s: (23.2...24.0)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del. quantity cm<sup>3</sup>/ : 3.1...3.7  
 100 s: (2.8...4.0)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 550  
 Rack travel in mm : 15.80...17.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del. quantity : 235.0...237.0  
 1000 : (232.0...240.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 550  
Rack travel in mm : 16.4

Testing:

1st rack travel in: 14.00  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 1000  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 99.0...109.0  
1000 s: (95.0...113.0)

Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm3/ : 164.0...168.0  
1000 s: (162.0...170.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.00  
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 L1  
 Edition : 23.11.90  
 Replaces : 6.7.90  
 Test oil : ISO-4113

Combination no. : 0 402 646 913

Injection pump  
 Pump designation : PE6P120A32ORS7218  
 EP type number : 0 412 626 839  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 15.00...15.10

---

Del. quantity cm<sup>3</sup>/ : 23.5...23.7

---

100 s: (23.2...24.0)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del. quantity cm<sup>3</sup>/ : 3.1...3.7  
 100 s: (2.8...4.0)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 7.80...8.00

2nd speed rpm : 250  
 travel mm : 0.70...1.10

3rd speed rpm : 400  
 travel mm : 2.50...3.10

4th speed rpm : 700  
 travel mm : 4.50...4.90

5th speed rpm : 1350  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850  
Aneroid pressure h : 1000  
Del.quantity : 235.0...237.0  
1000 : (232.0...240.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 14.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 78...86

Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 99.0...109.0  
1000 s : (95.0...113.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s : (14.00)  
Aneroid pressure h : -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 164.0...168.0  
1000 s : (162.0...170.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : UNI 13,8 g  
 Edition : 05.11.90  
 Replaces : 17.9.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 914  
 Injection pump  
 Pump designation : PE6P130A72ORS7197  
 EP type number : 0 412 636 815  
 Governor  
 Governor design. : RQ300/900PA968  
 Governor no. : 0 421 801 540

Customer spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42.153

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test Lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

J02

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900  
 Rack travel in mm : 13.50...13.60  
 Del.quantity cm<sup>3</sup>/ : 25.5...25.8  
 100 s: (25.1...26.1)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 5.1...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s: (1.5...2.9)  
 Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 255.0...258.0  
 1000 : (251.5...261.5)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (10.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 12.50  
 Speed rpm : 945...960  
 2nd rack travel in: 4.00  
 Speed rpm : 1070...1100

4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.80  
Speed rpm : 300  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 600  
Rack travel in m: 13.50...13.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 345  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 275  
Rack travel in m: 11.10...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm3/ : 269.0...276.0  
1000 s: (269.0...276.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 181.0...184.0  
1000 s: (177.5...187.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 945...960

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...270.0  
1000 s: (236.0...274.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.10...5.50  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm3 : 10.00  
1000 s: (14.00)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

APPLICATION

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 9,6 o  
 Edition : 23.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 917  
 Injection pump  
 Pump designation : PE6P120A320LS7834  
 EP type number : 0 412 626 841  
 Governor  
 Governor design. : RQ300/950PA971  
 Governor no. : 0 421 801 543

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm<sup>3</sup>/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 219.0...221.0

1000 : (216.0...224.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.90  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:

Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.50...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.35  
2nd speed rpm : 950  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 550  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1350  
Rack travel in m: 14.80...15.00 \*  
4th pressure hPa : -  
Rack travel in m: 9.50...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm3/ : 234.0...236.0  
1000 s: (231.0...239.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 241.0...244.0  
1000 s: (238.0...247.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11,0 t 8  
 Edition : 05.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 919  
 Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/950PA762-13  
 Governor no. : 0 421 801 544

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del. quantity cm<sup>3</sup>/ : 21.6...21.8

100 s: (21.3...22.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 750

Del. quantity : 216.0...218.0

1000 : (213.0...221.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 14.30  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 500  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 950  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1150  
Rack travel in m: 14.80...15.00  
5th pressure hPa : -  
Rack travel in m: 9.20...9.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1350  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 243.0...245.0  
1000 s: (240.0...248.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1350  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 239.0...243.0  
1000 s: (236.0...246.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.30  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11,0 t 9  
 Edition : 30.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 920  
 Injection pump  
 Pump designation : PE6P120A320S7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/950PA971-1  
 Governor no. : 0 421 801 547

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del. quantity cm<sup>3</sup>/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 950

Del. quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.10  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 600  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1150  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1250  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 9.20...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1550  
Speed rpm : 950  
Del.quantity cm3/ : 251.0...254.0  
1000 s: (248.0...257.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1550  
Speed rpm : 750  
Del.quantity cm3/ : 242.0...246.0  
1000 s: (239.0...249.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.10  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 9,6 p  
 Edition : 05.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 924  
 Injection pump  
 Pump designation : PE6P120A320LS7837  
 EP type number : 0 412 626 842  
 Governor  
 Governor design. : RQ300/950PA971-3  
 Governor no. : 0 421 801 557

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 250.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600  
 Rack travel in mm : 14.30...14.50  
 Del. quantity cm<sup>3</sup>/ : 22.7...22.9  
 100 s: (22.4...23.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 5.7...6.0  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del. quantity : 227.0...229.0  
 1000 : (224.0...232.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack trave: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.30...14.50

Measurement

Speed 1/min : 600  
1st pressure hPa : 400  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 640  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1240  
Rack travel in m: 14.40...14.60 \*  
4th pressure hPa : 1500  
Rack travel in m: 15.00...15.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1700  
Speed rpm : 950  
Del.quantity cm3/ : 252.0...254.0  
1000 s: (249.0...257.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1700  
Speed rpm : 800  
Del.quantity cm3/ : 263.0...265.0  
1000 s: (260.0...268.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,1 b
Edition : 30.11.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 646 925
Injection pump
Pump designation : PE6P120A320LS7837
EP type number : 0 412 626 842
Governor
Governor design. : RQV300...950PA797-20
Governor no. : 0 421 813 893

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 252.0
Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
(5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.30...14.50

Del.quantity cm3/ : 22.7...22.9

100 s: (22.4...23.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
travel mm : 1.00...1.50

2nd speed rpm : 567
travel mm : 4.40...4.90

3rd speed rpm : 780
travel mm : 6.10...6.60

4th speed rpm : 1009
travel mm : 8.30...8.80

5th speed rpm : 1190
travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1

Speed rpm : 1025
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h : 900  
Del.quantity : 227.0...229.0  
1000 : (224.0...232.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

#### Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 82...90

#### Testing:

Speed rpm : 200  
Minimum rack trave: 8.40  
Speed rpm : 300  
Rack travel in mm : 5.90...6.20

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 950  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 800  
Rack travel in m: 15.70...15.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.30...14.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 640  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1240

Rack travel in m: 14.40...14.60 \*  
4th pressure hPa : 1360  
Rack travel in m: 15.00...15.20  
5th pressure hPa : -  
Rack travel in m: 8.80...9.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1700  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 252.0...254.0  
1000 s: (249.0...257.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1700  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 263.0...265.0  
1000 s: (260.0...268.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 9,6 o 1  
 Edition : 30.11.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 646 926

Injection pump  
 Pump designation : PE6P120A320LS7834  
 EP type number : 0 412 626 841  
 Governor  
 Governor design. : RQV300...950PA797-19  
 Governor no. : 0 421 813 901

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 230.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)

Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 13.80...14.00

---

Del. quantity cm<sup>3</sup>/ : 21.9...22.1  
 100 s: (21.6...22.4)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.7...6.0  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 617  
 travel mm : 5.00...5.50

3rd speed rpm : 780  
 travel mm : 6.10...6.60

4th speed rpm : 1009  
 travel mm : 8.30...8.80

5th speed rpm : 1092  
 travel mm : 9.80...10.30

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 980  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 219.0...221.0  
1000 : (216.0...224.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 13.40  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 53...61

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION  
Speed rpm : 300...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.80...14.00

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 550  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 1350  
Rack travel in m: 13.90...14.10 \*  
4th pressure hPa : 1500  
Rack travel in m: 14.30...14.50

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm3/ : 234.0...236.0  
1000 s: (231.0...239.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 241.0...244.0  
1000 s: (238.0...247.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 q  
Edition : 23.11.90  
Replaces : 31.7.90  
Test oil : ISO-4113

Combination no. : 0 402 648 864

Injection pump  
Pump designation : PE8P120A320LS7816  
EP type number : 0 412 628 829  
Governor  
Governor design. : RQ300/950PA762-7  
Governor no. : 0 421 801 480

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del. quantity cm<sup>3</sup>/ : 25.4...25.6

100 s: (25.1...25.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del. quantity : 254.0...256.0

1000 : (251.0...259.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90  
2nd speed rpm : 950  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 700  
Rack travel in m: 13.80...14.00  
3rd pressure hPa : 1200  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1500  
Rack travel in m: 15.50...15.70  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm3/ : 270.0...273.0  
1000 s: (267.0...276.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 k 1  
 Edition : 23.11.90  
 Replaces : 31.7.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 881  
 Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQV300...950PA797-13  
 Governor no. : 0 421 813 841

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm<sup>3</sup>/ : 25.4...25.6

100 s: (25.1...25.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 700  
 travel mm : 5.50...6.00

3rd speed rpm : 1100  
 travel mm : 8.30...8.80

4th speed rpm : 1090  
 travel mm : 9.70...10.20

5th speed rpm : 1190  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 16.20...18.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h : 1000  
Del.quantity : 254.0...256.0  
1000 : (251.0...259.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

#### Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 82...90

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 950  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 12.00...12.20  
2nd pressure hPa : 700  
Rack travel in m: 13.80...14.00

3rd pressure hPa : 1200  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1500  
Rack travel in m: 15.50...15.70  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm3/ : 270.0...273.0  
1000 s: (267.0...276.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks: :

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MTU 14,6 a1  
 Edition : 16.11.90  
 Replaces : 31.7.90  
 Test oil : ISO-4113

Combination no. : 0 402 648 884

Injection pump  
 Pump designation : PE8P120A320LS7830  
 EP type number : 0 412 628 844  
 Governor  
 Governor design. : RQV350...1150PA870-10  
 Governor no. : 0 421 813 879

Customer-spec. information  
 Customer : MTU

Engine : 8V 183 TE92

1st version kw : 490.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 19.50...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 1150

---

Rack travel in mm : 14.80...14.90

---

Del. quantity cm<sup>3</sup>/ : 31.1...31.3  
 100 s: (30.8...31.6)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.0...5.6  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.30...1.80  
 2nd speed rpm : 454  
 travel mm : 3.30...3.80  
 3rd speed rpm : 960  
 travel mm : 5.30...5.80  
 4th speed rpm : 1206  
 travel mm : 7.90...8.40  
 5th speed rpm : 1380  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1275  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 2000  
Del.quantity : 311.0...313.0  
1000 : (308.0...316.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 113...121

Testing:

1st rack travel in: 13.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 62...70

Testing:

Speed rpm : 250  
Minimum rack trave: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.60

CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 7.10...7.30

Measurement

Speed 1/min : 500

1st pressure hPa : 400  
Rack travel in m: 8.30...8.40  
2nd pressure hPa : 1200  
Rack travel in m: 12.50...12.80

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

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1st version

Aneroid pressure h: 2000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 303.0...313.0  
1000 s: (300.0...316.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 2000

Speed rpm : 1150  
Del.quantity cm<sup>3</sup>/ : 240.0...243.0 \*  
1000 s: (237.0...246.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (117.0...125.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 320.0...340.0  
1000 s: (316.0...344.0)

Remarks:

:

\* = Set at reduced-delivery stop.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 12,8 o  
 Edition : 15.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 893  
 Injection pump  
 Pump designation : PE8P120A320LS7835  
 EP type number : 0 412 628 847  
 Governor  
 Governor design. : RQ300/950PA971-2  
 Governor no. : 0 421 801 548

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 600  
 Rack travel in mm : 14.60...14.80  
 Del. quantity cm<sup>3</sup>/ : 22.1...22.3  
 100 s: (21.8...22.6)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.2...6.8  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del. quantity : 221.0...223.0  
 1000 : (218.0...226.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 950  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600  
1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 600  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1100  
Rack travel in m: 14.70...14.90 \*  
4th pressure hPa : -  
Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm3/ : 222.0...225.0  
1000 s: (219.0...228.0)

Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,8 o 1  
Edition : 23.11.90  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 894  
  
Injection pump  
Pump designation : PE8P12DA32OLS7835  
EP type number : 0 412 628 847  
Governor  
Governor design. : RQV300...950PA797-18  
Governor no. : 0 421 813 886

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
                  : (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del. quantity cm<sup>3</sup>/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...7.0

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.50

2nd speed rpm : 567

travel mm : 4.40...4.90

3rd speed rpm : 780

travel mm : 6.10...6.60

4th speed rpm : 1009

travel mm : 8.30...8.80

5th speed rpm : 1092

travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 980

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 221.0...223.0  
1000 : (218.0...226.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 122...130

#### Testing:

1st rack travel in: 13.40  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control Lever  
position degrees: 80...88

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...7.00

#### CONSTANT REGULATION

Speed rpm : 250...360

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 14.40...14.60  
2nd speed rpm : 800  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 850  
Rack travel in m: 14.60...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.60...14.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : 250

Rack travel in m: 10.00...10.20  
2nd pressure hPa : 600  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1100  
Rack travel in m: 14.70...14.90 \*  
4th pressure hPa : 1200  
Rack travel in m: 14.90...15.10  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 222.0...225.0  
1000 s: (219.0...228.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 21,6 c  
Edition : 16.11.90  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 670 808  
Injection pump  
Pump designation : PE12P120A520/5RS7212  
EP type number : 0 412 620 823  
Governor  
Governor design. : RSUV325...1150POA359  
Governor no. : 0 421 829 108

Customer-spec. information  
Customer : MWM

Engine : TBD234V12

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 019  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test lines : 1 680 750 067  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 4.60...4.70  
                  : (4.55...4.75)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 9- 10- 5- 6-  
                  11- 12- 3- 4- 7- 8

Phasing : 0-30-60-90-120-150-  
                  180-210-240-270-300-  
                  330

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 13.40...13.50  
Del. quantity cm<sup>3</sup>/ : 26.0...26.2  
100 s: (25.8...26.6)  
Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 6.9...7.1  
Del. quantity cm<sup>3</sup>/ : 3.0...4.0  
100 s: (2.7...4.3)  
Spread cm<sup>3</sup> : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 4.00

## RATED SPEED

1st version  
Control lever  
position degrees: 106...114  
Testing:  
1st rack travel in: 12.40  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1440  
Speed rpm : 0.30...1.40

## LOW IDLE 1

Control lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 440...500

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1250  
Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 625  
Rack travel in m: 12.00...12.10

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 330.0...370.0  
1000 s: (-)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.90...7.10  
Del.quantity cm3/ : 30.0...40.0  
1000 s: (27.0...43.0)  
Spread cm3 : 6.00  
1000 s: (10.00)

Remarks:

:

\* = Element disconnected at idle for  
cylinders 2, 4, 6, 8, 10 and 12.

Hydraulic latching of starting  
delivery.

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Latching at 0.75 bar...0.85 bar.

Unlatching at 0.35 bar...0.45 bar.

Full-load delivery not known. Set  
according to engine test report.

Test specifications upon request.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 t  
Edition : 17.10.90  
Replaces : 16.8.90  
Test oil : ISO-4113  
  
Combination no. : 0 402 736 805  
  
Injection pump  
Pump designation : PES6P12QA12ORS7206  
EP type number : 0 412 726 835  
Governor  
Governor design. : RQV350..1100PA924-5K  
Governor no. : 0 421 815 250

Customer-spec. information  
Customer : CUMMINS

Engine : 6CTAA

1st version kw : 202.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 047

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 3.50...3.60  
                  : (3.45...3.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100  

---

Rack travel in mm : 12.10...12.20  

---

Del. quantity cm<sup>3</sup>/ : 15.8...16.0  
100 s: (15.5...16.3)  

---

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)  

---

2nd speed rpm : 350.0  
Rack travel in mm : 5.2...5.4  
Del. quantity cm<sup>3</sup>/ : 2.3...2.9  
100 s: (2.1...3.1)  
Spread cm<sup>3</sup> : 0.7  
100 s: (1.1)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.10...1.50  
2nd speed rpm : 550  
travel mm : 3.40...4.00  
3rd speed rpm : 900  
travel mm : 6.10...6.70  
4th speed rpm : 1150  
travel mm : 8.40...8.60  
5th speed rpm : 1250  
travel mm : 9.40...9.80

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1420  
Rack travel in mm : 6.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200

Del. quantity : 158.0...160.0  
1000 : (155.0...163.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 11.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 71...79

Testing:  
Speed rpm : 250  
Minimum rack travel: 6.80  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 600  
Rack travel in m: 11.10...11.30  
3rd speed rpm : 800  
Rack travel in m: 11.70...11.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 12.10...12.20

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 8.10...8.30  
2nd pressure hPa : 600  
Rack travel in m: 11.10...11.30  
3rd pressure hPa : 300

K01

Rack travel in m: 8.70...9.10

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 174.0...180.0  
1000 s: (171.0...183.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 105.0...109.0  
1000 s: (103.0...111.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 235.0...255.0  
1000 s: (231.0...259.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del. quantity cm<sup>3</sup>/ : 23.0...29.0  
1000 s: (21.0...31.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (11.00)

#### Remarks:

: C.D.C. # 321182  
Start-of delivery mark/lock = 7.5°  
angular displacement of the cam after  
start of delivery of cylinder 1.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : CUM 5,9 w  
 Edition : 15.11.90  
 Replaces : 8.8.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 736 806  
  
 Injection pump  
 Pump designation : PES6P110A120RS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964K  
 Governor no. : 0 421 815 252

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 171.5  
 Rated speed : 2500

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 15.50...15.60

Del. quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 0.70...1.10

2nd speed rpm : 400  
travel mm : 1.40...1.60

3rd speed rpm : 600  
travel mm : 2.90...3.30

4th speed rpm : 1300  
travel mm : 7.20...7.40

5th speed rpm : 1500  
travel mm : 9.10...9.50

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del. quantity : 165.5...167.5

1000 : (162.5...170.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

#### Testing:

1st rack travel in: 14.50  
Speed rpm : 1295...1305  
2nd rack travel in: 4.00  
Speed rpm : 1470...1500  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 13...21

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 15.50...15.60  
2nd speed rpm : 800  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 700  
Rack travel in m: 13.90...14.30

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

#### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 400  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 800  
Rack travel in m: 13.30...13.70

#### START CUT-OUT

Speed 1/min : 295 (305)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 176.0...182.0  
1000 s: (173.0...185.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 82.5...86.5  
1000 s: (80.5...88.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 1295...1305

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 155.0...175.0  
1000 s: (150.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C # 3913440  
Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 r  
 Edition : 15.11.90  
 Replaces : 8.11.90  
 Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1100PA964-1  
 K  
 Governor no. : 0 421 815 253

Customer spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 201.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

---

Rack travel in mm : 15.70...15.80

---

Del. quantity cm<sup>3</sup>/ : 20.6...20.8  
 100 s: (20.3...21.1)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...5.9  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 600  
 travel mm : 5.10...5.50

4th speed rpm : 1000  
 travel mm : 8.10...8.30

5th speed rpm : 1200  
 travel mm : 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1500  
 Del. quantity : 206.0...208.0  
 1000 : (203.0...211.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 64...72

Testing:  
1st rack travel in: 14.40  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 15.70...15.80  
2nd speed rpm : 650  
Rack travel in m: 13.70...14.10  
3rd speed rpm : 1100  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1050  
Pressure hPa : 1500  
Rack travel mm : 15.70...15.80

Measurement  
Speed 1/min : 1050

1st pressure hPa : -  
Rack travel in m: 8.40...8.80  
2nd pressure hPa : 340  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 840  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 275 (285)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 197.5...203.5  
1000 s: (194.5...206.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 160.0...180.0  
1000 s: (155.0...185.0)  
Rack travel in mm : 11.40...12.40

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del. quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3916627

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:  
Sliding-sleeve position = 37.0 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 w 1  
 Edition : 15.11.90  
 Replaces : 8.11.90  
 Test oil : ISO-4113

Combination no. : 0 402 736 810

Injection pump  
 Pump designation : PES6P110A120RS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964-2  
 K  
 Governor no. : 0 421 815 254

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 141.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

---

Rack travel in mm : 14.80...14.90

---

Del.quantity cm<sup>3</sup>/ : 15.9...16.1  
 100 s: (15.6...16.4)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 400.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 3.2...3.8  
 100 s: (3.0...4.0)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 1.40...1.60

3rd speed rpm : 600  
 travel mm : 2.90...3.30

4th speed rpm : 1300  
 travel mm : 7.20...7.40

5th speed rpm : 1500  
 travel mm : 9.10...9.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 1200  
 Del.quantity : 159.0...161.0  
 1000 : (156.0...164.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1295...1305  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 800  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 14.80...14.90

#### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 415  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 740  
Rack travel in m: 13.00...13.40

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 158.0...164.0  
1000 s: (155.0...167.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 95.5...99.5  
1000 s: (93.5...101.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1295...1305

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 155.0...175.0  
1000 s: (150.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3919090

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.



Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1375...1405  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 650  
Rack travel in m: 11.20...11.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 225  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 515  
Rack travel in m: 11.20...11.60

#### START CUT-OUT

Speed 1/min : 265 (270)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 152.5...158.5  
1000 s: (149.5...161.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 11.00...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3917088

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 r 4  
 Edition : 15.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 813  
 Injection pump  
 Pump designation : PES6P110A12ORS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1100PA964-5  
 K  
 Governor no. : 0 421 815 257  
 Customer-spec. information  
 Customer : C.D.C.  
 Engine : 6CTA-A  
 1st version kW : 187.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 1 417 413 047  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 115...125  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24  
 Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100  
 Rack travel in mm : 14.50...14.60  
 Del.quantity cm<sup>3</sup>/ : 18.6...18.8  
 100 s: (18.3...19.1)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 600  
 travel mm : 5.10...5.50  
 4th speed rpm : 1000  
 travel mm : 8.10...8.30  
 5th speed rpm : 1200  
 travel mm : 9.60...10.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 186.5...188.5  
 1000 : (183.5...191.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 13.50...13.70  
3rd speed rpm : 500  
Rack travel in m: 12.70...13.10

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 8.40...8.80  
2nd pressure hPa : 285  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 700  
Rack travel in m: 12.70...13.10

#### START CUT-OUT

Speed 1/min : 260 (270)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 198.0...204.0  
1000 s: (195.0...207.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 10.80...11.80

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del. quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3916628

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : CUM 8,3 r 1  
 Edition : 15.11.90  
 Replaces : 8.11.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 736 814  
  
 Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-6  
 K  
 Governor no. : 0 421 815 258

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 187.0  
 Rated speed : 2400

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 14.50...14.60

Del. quantity cm<sup>3</sup>/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 700  
 travel mm : 5.90...6.30  
 4th speed rpm : 1200  
 travel mm : 9.00...9.20  
 5th speed rpm : 1400  
 travel mm : 10.70...11.10

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del. quantity : 183.0...185.0  
 1000 : (180.0...188.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1405...1435  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 11.60...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 270  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 700  
Rack travel in m: 12.60...13.00

START CUT-OUT

Speed 1/min : 265 (270)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 167.5...173.5  
1000 s: (164.5...176.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del. quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3917089

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:  
Sliding-sleeve position = 37.0 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 r 5  
 Edition : 15.11.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 736 815

Injection pump  
 Pump designation : PES6P110A12ORS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1000PA964-7  
 K  
 Governor no. : 0 421 815 259

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 194.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.80...15.90

Del.quantity cm<sup>3</sup>/ : 21.7...21.9

100 s: (21.4...22.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.60...1.80

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 600  
 travel mm : 5.20...5.60

4th speed rpm : 1000  
 travel mm : 8.70...8.90

5th speed rpm : 1150  
 travel mm : 10.10...10.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1500  
 Del.quantity : 217.0...219.0  
 1000 : (214.0...222.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 14.30  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1205...1235  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 650  
Rack travel in m: 14.00...14.40  
3rd speed rpm : 1000  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1500  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.40...8.80  
2nd pressure hPa : 340  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 840  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 211.0...217.0  
1000 s: (208.0...220.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.30  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 10.90...11.90

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3916629

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:  
Sliding-sleeve position = 37.0 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : CUM 8,3 r 2  
 Edition : 15.11.90  
 Replaces : 8.11.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 736 816  
  
 Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-8  
 K  
 Governor no. : 0 421 815 264  
  
 Customer-spec. information  
 Customer : C.D.C.  
  
 Engine : 6CTA-A  
  
 1st version kW : 213.0  
 Rated speed : 2400

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 047  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 115...125  
  
 Test nozzle holder  
 assembly : 1 688 901 101  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,6  
  
 Test lines : 1 680 750 008  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
  
 Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4  
  
 Phasing : 0-60-120-180-240-300  
  
 Tolerance + - ° : 0.50 (0.75)  
  
 Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1100  


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 Rack travel in mm : 14.70...14.80  


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 Del.quantity cm<sup>3</sup>/ : 19.0...19.2  
 100 s: (18.7...19.5)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  


---

 2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

### (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 700  
 travel mm : 5.90...6.30  
 4th speed rpm : 1200  
 travel mm : 9.00...9.20  
 5th speed rpm : 1400  
 travel mm : 10.70...11.10

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 190.0...192.0  
 1000 : (187.0...195.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

#### Testing:

1st rack travel in: 13.20  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 650  
Rack travel in m: 12.50...12.90  
3rd speed rpm : 1200  
Rack travel in m: 14.20...14.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.80

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 260  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 710  
Rack travel in m: 12.80...13.20

#### START CUT-OUT

Speed 1/min : 265 (270)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 181.0...187.0  
1000 s: (178.0...190.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del. quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3916626

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11,7 f  
Edition : 19.10.90  
Replaces : 8.6.88  
Test oil : ISO-4113

Combination no. : 0 402 746 808

Injection pump  
Pump designation : PES6P120A720LS7107  
EP type number : 0 412 726 801  
Governor  
Governor design. : RQ300/1100PA805  
Governor no. : 0 421 801 352

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447ha

1st version kW : 206.0  
Rated speed : 2200

### TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.40...13.50

Del. quantity cm<sup>3</sup>/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 750

Del. quantity : 197.0...199.0

1000 : (194.0...202.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.40  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.40...11.70

Measurement

Speed 1/min : 500

1st pressure hPa : 230  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 370  
Rack travel in m: 13.10...13.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750  
Speed rpm : 600  
Del.quantity cm3/ : 193.0...196.0  
1000 s: (190.0...199.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...170.0  
1000 s: (146.0...174.0)

Remarks:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a3  
 Edition : 15.11.90  
 Replaces : 4.9.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 852  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA909K  
 Governor no. : 0 421 815 210

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-400

1st version kW : 298.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.80...15.90

Del. quantity cm<sup>3</sup>/ : 27.5...27.7

100 s: (27.2...28.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 5.1...5.3  
 Del. quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 650  
 travel mm : 5.60...5.80  
 4th speed rpm : 900  
 travel mm : 8.30...8.50  
 5th speed rpm : 1100  
 travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del. quantity : 275.0...277.0  
 1000 : (272.0...280.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 58...66

### Testing:

1st rack travel in: 14.80  
Speed rpm : 940...970  
2nd rack travel in: 4.00  
Speed rpm : 1115...1125  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 7...15

### Testing:

Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 5.10...5.30

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.80...15.90

### Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 325  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 790  
Rack travel in m: 13.80...14.20

## START CUT-OUT

K21

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 302.5...308.5  
1000 s: (299.5...311.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 157.5...161.5  
1000 s: (155.5...163.5)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 14.80  
Speed rpm : 940...970

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 10.80...11.40

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

## Remarks:

: MACK # 313GC5185-P6

## Bow dimension:

Sliding-sleeve position = 37.0 mm  
\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a4  
 Edition : 15.11.90  
 Replaces : 4.9.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 853  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA909-1K  
 Governor no. : 0 421 815 211

Customer spec. information  
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del. quantity cm<sup>3</sup>/ : 23.1...23.3

100 s: (22.9...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del. quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 2.80...3.20

3rd speed rpm : 650  
travel mm : 5.60...5.80

4th speed rpm : 900  
travel mm : 8.30...8.50

5th speed rpm : 1100  
travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del. quantity : 231.5...233.5

1000 : (229.5...235.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.60  
Speed rpm : 940...970  
2nd rack travel in: 4.00  
Speed rpm : 1090...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 625  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.70

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 685  
Rack travel in m: 12.10...12.50

## START CUT-OUT

Speed 1/min : 275 (285)

K23

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 263.0...269.0  
1000 s: (260.0...272.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 153.0...157.0  
1000 s: (151.0...159.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 940...970

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...215.0  
1000 s: (165.0...225.0)  
Rack travel in mm : 9.00...11.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P2

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.



Bow dimension:  
Sliding-sleeve position = 37.0 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 12,0 h3  
 Edition : 15.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 887  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...975PA944-2K  
 Governor no. : 0 421 815 237

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-300A

1st version kW : 224.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 975  
 Rack travel in mm : 13.00...13.10  
 Del.quantity cm<sup>3</sup>/ : 22.5...22.7  
 100 s: (22.2...23.0)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 950  
 travel mm : 7.90...8.10  
 4th speed rpm : 1200  
 travel mm : 10.20...10.60

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 975  
 Aneroid pressure h: 1200  
 Del.quantity : 225.0...227.0  
 1000 : (222.0...230.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 500  
Rack travel in m: 11.30...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.10

Measurement  
Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 7.90...8.30  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 640  
Rack travel in m: 11.60...12.00

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 240.5...246.5  
1000 s: (237.5...249.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 149.0...153.0  
1000 s: (147.0...155.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1015...1045

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P8

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Bow dimension:

Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 7,8 k  
 Edition : 16.11.90  
 Replaces : 10.8.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 889  
  
 Injection pump  
 Pump designation : PES6P120A72ORS7179  
 EP type number : 0 412 726 826  
 Governor  
 Governor design. : RQV350...1000PA917-1  
 K  
 Governor no. : 0 421 815 236

Customer-spec. information  
 Customer : FNH

Engine : 7.8L

1st version kW : 160.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 2 417 413 072

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

K28

Test pressure, bar: 17...19  
  
 Prestroke mm : +.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  


---

 Rack travel in mm : 12.50...12.60  


---

 Del. quantity cm<sup>3</sup>/ : 15.9...16.1  
 100 s: (15.6...16.4)  


---

 Spread cm<sup>3</sup> : 0.7  
 100 s: (1.1)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.0...5.4  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s: (1.8...2.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 350  
 travel mm : 2.10...2.40  
 2nd speed rpm : 450  
 travel mm : 3.50...3.90  
 3rd speed rpm : 800  
 travel mm : 6.90...7.30  
 4th speed rpm : 1000  
 travel mm : 8.60...8.80  
 5th speed rpm : 1200  
 travel mm : 10.70...11.10

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1230  
 Rack travel in mm : 6.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000  
Aneroid pressure h : 1400  
Del.quantity : 159.0...161.0  
1000 : (156.0...164.0)  
Spread cm3 : 7.00  
1000 : (11.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

#### Testing:

1st rack travel in: 11.50  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 63...71

#### Testing:

Speed rpm : 100  
Minimum rack trave: 6.70  
Speed rpm : 350  
Rack travel in mm : 5.00...5.40

#### CONSTANT REGULATION

Speed rpm : 320...500

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 750  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 650  
Rack travel in m: 12.50...12.90

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 750  
Pressure hPa : 1400  
Rack travel mm : 13.10...13.30

#### Measurement

Speed 1/min : 750

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 310

L01

Rack travel in m: 9.60...9.70  
3rd pressure hPa : 620  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm3/ : 187.0...193.0  
1000 s: (184.0...196.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 101.0...103.0  
1000 s: (98.0...106.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...180.0  
1000 s: (146.0...186.0)  
Rack travel in mm : 10.90...11.50

#### Remarks:

: FNH # E9HN-9A543-PA

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 12,0 h  
 Edition : 15.11.90  
 Replaces : 8.8.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 890  
 Injection pump  
 Pump designation : PES6P120A72ORS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...875PA944-5K  
 Governor no. : 0 421 815 240

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-275

1st version kW : 202.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875  
 Rack travel in mm : 13.20...13.30  
 Del. quantity cm<sup>3</sup>/ : 23.5...23.7  
 100 s: (23.2...24.0)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.8...5.0  
 Del. quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 3.30...3.70  
 3rd speed rpm : 700  
 travel mm : 7.90...8.30  
 4th speed rpm : 900  
 travel mm : 9.40...9.60  
 5th speed rpm : 1050  
 travel mm : 10.60...11.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 235.5...237.5  
 1000 : (232.5...240.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)



### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 12.20  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1065...1075  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 510  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 600  
Rack travel in m: 13.80...14.00  
4th speed rpm : 450  
Rack travel in m: 13.10...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.80...14.00

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 310  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 635  
Rack travel in m: 12.50...12.90

START CUT-OUT

L03

Speed 1/min : 250 (255)

### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 309.0...315.0  
1000 s: (306.0...318.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 155.5...159.5  
1000 s: (153.5...161.5)

### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 915...945

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5188-P4

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test

bench: setting for test equipment,  
check value for engine equipment.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 12,0 h4  
 Edition : 15.11.90  
 Replaces : 17.9.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 891

Injection pump  
 Pump designation : PES6P120A72ORS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...875PA944-6K  
 Governor no. : 0 421 815 241

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-250

1st version kW : 187.0  
 Rated speed : 1750

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow quantity min. 1/h: 160...170

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 21.5...21.7

100 s: (21.2...22.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30

4th speed rpm : 900

travel mm : 9.40...9.60

5th speed rpm : 1050

travel mm : 10.60...11.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 215.0...217.0

1000 : (212.0...220.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.50  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1045...1055  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 510  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 600  
Rack travel in m: 13.40...13.60  
4th speed rpm : 450  
Rack travel in m: 12.70...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 285  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570  
Rack travel in m: 12.10...12.50

START CUT-OUT

L06

Speed 1/min : 250 (255)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 291.5...297.5  
1000 s: (288.5...300.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 153.0...157.0  
1000 s: (151.0...159.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 915...945

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5188-P2

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,

check value for engine equipment.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 12,0 h5  
 Edition : 15.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 892  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...975PA944-7K  
 Governor no. : 0 421 815 242

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-250A

1st version kw : 180.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 975  


---

 Rack travel in mm : 12.30...12.40  


---

 Del.quantity cm<sup>3</sup>/ : 20.5...20.7  
 100 s: (20.2...21.0)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 950  
 travel mm : 7.90...8.10  
 4th speed rpm : 1200  
 travel mm : 10.20...10.60

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 975  
 Aneroid pressure h: 1200  
 Del.quantity : 205.5...207.5  
 1000 : (202.5...210.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1175...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 600  
Rack travel in m: 12.20...12.40  
3rd speed rpm : 800  
Rack travel in m: 12.40...12.60  
4th speed rpm : 500  
Rack travel in m: 11.40...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 330  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 570  
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 250 (255)

L09

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1015...1045

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P6

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.



Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h2  
 Edition : 15.11.90  
 Replaces : 17.9.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 896  
  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...900PA944-11  
 K  
 Governor no. : 0 421 815 260  
  
 Customer-spec. information  
 Customer : MACK TRUCKS  
  
 Engine : E7-350  
  
 1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 2 417 413 011  
  
 Overflow  
 quantity min. 1/h: 160...170  
  
 Test nozzle holder  
 assembly : 1 688 901 101  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,6  
  
 Test lines : 1 680 750 008  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
  
 Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900  


---

 Rack travel in mm : 14.50...14.60  


---

 Del. quantity cm<sup>3</sup>/ : 27.7...27.9  
 100 s: (27.4...28.2)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)

2nd speed rpm : 335.0  
 Rack travel in mm : 4.7...4.9  
 Del. quantity cm<sup>3</sup>/ : 3.3...3.9  
 100 s: (3.1...4.1)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 700  
 travel mm : 6.00...6.40  
 4th speed rpm : 900  
 travel mm : 8.50...8.70  
 5th speed rpm : 1050  
 travel mm : 9.80...10.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del. quantity : 277.5...279.5  
 1000 : (274.5...282.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

### Testing:

1st rack travel in: 13.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 5.10...5.30

### CONSTANT REGULATION

Speed rpm : 325...520

### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 625  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.20  
4th speed rpm : 675  
Rack travel in m: 13.60...13.80  
5th speed rpm : 500  
Rack travel in m: 11.90...12.30

### Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

### Measurement

Speed 1/min : 900  
1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 400  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 775

Rack travel in m: 12.70...13.10

### START CUT-OUT

Speed 1/min : 250 (255)

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 290.0...296.0  
1000 s: (287.0...299.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

### BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 940...950

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

### LOW IDLE

Speed rpm : 335  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 33.0...39.0  
1000 s: (31.0...41.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

### Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

### Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only

to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 12,0 h1  
 Edition : 15.11.90  
 Replaces : 5.10.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 897

Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...875PA944-12  
 K  
 Governor no. : 0 421 815 261

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-300

1st version kw : 224.0  
 Rated speed : 1750

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)

Rack travel in mm : 11.00...13.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

---

Rack travel in mm : 14.00...14.10

---

Del. quantity cm<sup>3</sup>/ : 25.0...25.2  
 100 s: (24.7...25.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 5.1...5.5  
 Del. quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.40...1.60

2nd speed rpm : 450  
 travel mm : 3.30...3.70

3rd speed rpm : 700  
 travel mm : 7.90...8.30

4th speed rpm : 900  
 travel mm : 9.40...9.60

5th speed rpm : 1050  
 travel mm : 10.60...11.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 250.0...252.0  
 1000 : (247.0...255.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 61...69

### Testing:

1st rack travel in: 13.00  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1075...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 5.10...5.50

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 510  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 575  
Rack travel in m: 14.70...14.90  
4th speed rpm : 450  
Rack travel in m: 13.80...14.20

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.90

### Measurement

Speed 1/min : 510  
1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 370  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 760  
Rack travel in m: 13.30...13.70

## START CUT-OUT

Speed 1/min : 250 (255)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 328.0...334.0  
1000 s: (325.0...337.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (159.5...183.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 156.0...160.0  
1000 s: (154.0...162.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 915...945

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

## Remarks:

: MACK # 313GC5188-P10

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

## Bow dimension:

Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test

bench: setting for test equipment,  
check value for engine equipment.

3



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 j  
 Edition : 19.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 899  
 Injection pump  
 Pump designation : PES6P12DA72ORS7222  
 EP type number : 0 412 726 839  
 Governor  
 Governor design. : RQV325...900PA909-1K  
 Governor no. : 0 421 815 211

Customer-spec. information  
 Customer : MACK

Engine : E7-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del. quantity cm<sup>3</sup>/ : 23.1...23.3

100 s: (22.8...23.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del. quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.7...4.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 650  
 travel mm : 5.60...5.80  
 4th speed rpm : 900  
 travel mm : 8.30...8.50  
 5th speed rpm : 1100  
 travel mm : 10.30...10.80

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1110  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900

Aneroid pressure h: 1200  
Del. quantity : 231.5...233.5  
1000 : (228.5...236.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 12.60  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

#### Testing:

Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 625  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...12.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.70

#### Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50

3rd pressure hPa : 685  
Rack travel in m: 12.10...12.50

#### START CUT-OUT

Speed 1/min : 275 (285)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 625  
Del. quantity cm<sup>3</sup>/ : 263.0...269.0  
1000 s: (260.0...272.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 153.0...157.0  
1000 s: (151.0...159.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 175.0...215.0  
1000 s: (165.0...225.0)  
Rack travel in mm : 9.00...11.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del. quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (37.0...49.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MACK # 313GC5185-P2

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

#### Bow dimension:

Sliding-sleeve position = 37.0 mm



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 8,8 K 6  
 Edition : 14.09.90  
 Replaces : 05.11.86  
 Test oil : ISO-4113

Combination no. : 0 403 446 180

Injection pump  
 Pump designation : PES6MW100/32ORS1016  
 EP type number : 0 413 406 010  
 Governor  
 Governor design. : RQV300...1300MW25-6  
 Governor no. : 0 420 083 115

Customer-spec. information  
 Customer : RVI

Engine : MIDR-062-12-I

1st version kW : 130.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 021

Inlet press., bar : 2.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 173...176

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

---

Rack travel in mm : 11.50...11.60

---

Del.quantity cm<sup>3</sup>/ : 9.1...9.3

---

100 s : (8.9...9.5)

---

Spread cm<sup>3</sup> : 0.3

---

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.30...6.40

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s : (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 91.0...93.0

1000 : (89.0...95.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 61...69

Testing:  
 1st rack travel in: 10.50  
 Speed rpm : 1350...1370

2nd rack travel in: 4.00  
 Speed rpm : 1480...1510

4th rack travel in: 1600  
 Speed rpm : 0.00...1.00

**LOW IDLE 1**

Control Lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6  
Speed rpm : 300  
Rack travel in mm : 6.30...6.40  
Speed rpm : 200  
Maximum rack trave: 3.70

CONSTANT REGULATION  
Speed rpm : 325...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 220  
Rack travel mm : 9.90...10.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 700  
Rack travel in m: 11.50...11.60  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 265  
Rack travel in m: 10.80...11.10

#### START CUT-OUT

Speed 1/min : 230 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 88.0...92.0  
1000 s: (86.0...94.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1350...1370

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.40  
Del.quantity cm<sup>3</sup>/ : 9.5...13.5  
1000 s: (7.0...16.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 D 71  
 Edition : 16.11.90  
 Replaces : 16.02.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 226  
 Injection pump  
 Pump designation : PES6MW100/720RS1131-  
 1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQ300/1300MW105  
 Governor no. : 0 420 082 039

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 14.60...14.70  
 Del.quantity cm<sup>3</sup>/ : 12.0...12.2  
 100 s: (11.8...12.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 1450  
 travel mm : 9.40...9.80  
 2nd speed rpm : 1360  
 travel mm : 7.20...7.40  
 3rd speed rpm : 550  
 travel mm : 4.20...4.80  
 4th speed rpm : 300  
 travel mm : 1.30...1.70

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -2  
 Speed rpm : 1200  
 Rack travel in mm : 14.70...16.30

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del.quantity : 120.0...122.0  
 1000 : (118.0...124.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 101...109

Setting point:  
Speed rpm : 1200  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 13.60  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.60...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 500  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 1000  
Rack travel in m: 14.60...14.70

#### START CUT-OUT

Speed 1/min : 180 (200)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 111.0...115.0  
1000 s: (109.0...117.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 41.0...43.0  
1000 s: (39.0...45.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 1345...1360

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 6,0 D 65  
 Edition : 16.11.90  
 Replaces : 31.08.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 259  
 Injection pump  
 Pump designation : PES6MM100/72ORS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV300...1300MW68-2  
 Governor no. : 0 420 083 224

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kw : 177.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test Lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 14.40...14.50  
 Del.quantity cm<sup>3</sup>/ : 11.4...11.6  
 100 s : (11.2...11.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s : (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.40...9.80  
 2nd speed rpm : 1350  
 travel mm : 8.40...8.60  
 3rd speed rpm : 600  
 travel mm : 3.90...4.50  
 4th speed rpm : 300  
 travel mm : 0.80...1.20

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Anoroid pressure h: 1000  
 Del.quantity : 114.0...116.0  
 1000 : (112.0...118.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 400  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 35.0...37.0  
1000 s: (33.0...39.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 V 3  
 Edition : 30.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 266  
 Injection pump  
 Pump designation : PES6MW100/32ORS1185  
 EP type number : 0 413 406 170  
 Governor  
 Governor design. : RQV350...1200MW46-35  
 Governor no. : 0 420 083 229

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85  
 : (3.70...3.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 800  
 Rack travel in mm : 13.50...13.60  
 Del. quantity cm<sup>3</sup>/ : 13.7...13.9  
 100 s: (13.5...14.1)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.0...6.2  
 Del. quantity cm<sup>3</sup>/ : 1.4...1.8  
 100 s: (1.1...2.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1350  
 travel mm : 8.80...9.20  
 2nd speed rpm : 1250  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del. quantity : 137.0...139.0  
 1000 : (135.0...141.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 100...108

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1280...1300  
2nd rack travel in: 4.00  
Speed rpm : 1415...1425  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION  
Speed rpm : 360...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 225  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.6060  
2nd pressure hPa : 525  
Rack travel in m: 12.30...12.70  
3rd pressure hPa : 900  
Rack travel in m: 13.50...13.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 134.0...138.0  
1000 s: (132.0...140.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 62.5...64.5  
1000 s: (60.5...66.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1280...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : IHC #1817113C91

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter. In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 V 2  
 Edition : 16.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 267  
 Injection pump  
 Pump designation : PES6MW100/32DRS1185  
 EP type number : 0 413 406 170  
 Governor  
 Governor design. : RQV350...1200MW46-36  
 Governor no. : 0 420 083 230

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 156.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85  
 : (3.70...3.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 800  
 Rack travel in mm : 12.70...12.80  
 Del.quantity cm<sup>3</sup>/ : 12.5...12.7  
 100 s: (12.3...12.9)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.0...6.2  
 Del.quantity cm<sup>3</sup>/ : 1.4...1.8  
 100 s: (1.1...2.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1350  
 travel mm : 8.30...8.50  
 2nd speed rpm : 1460  
 travel mm : 9.10...9.50  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 900  
 Del.quantity : 125.5...127.5  
 1000 : (123.5...129.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 97...105

Testing:

1st rack travel in: 11.70  
Speed rpm : 1275...1295  
2nd rack travel in: 4.00  
Speed rpm : 1410...1420  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION

Speed rpm : 360...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 280  
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 500  
Rack travel in m: 12.00...12.40  
3rd pressure hPa : 900  
Rack travel in m: 12.70...12.80

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm3/ : 124.5...128.5  
1000 s: (122.5...130.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

MD2

Speed rpm : 500  
Del.quantity cm3/ : 71.5...73.5  
1000 s: (69.5...75.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1275...1295

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1817110C91

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 V 1  
Edition : 16.11.90  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 268  
Injection pump  
Pump designation : PES6MM100/32ORS1185  
EP type number : 0 413 406 170  
Governor  
Governor design. : RQV350...1200MM46-37  
Governor no. : 0 420 083 231

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 156.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85  
                  : (3.70...3.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 6.0...6.2  
Del.quantity cm<sup>3</sup>/ : 1.4...1.8  
100 s: (1.1...2.0)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.30...8.50  
2nd speed rpm : 1460  
travel mm : 9.10...9.50  
3rd speed rpm : 550  
travel mm : 3.10...3.70  
4th speed rpm : 350  
travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 800  
Aneroid pressure h: 900  
Del.quantity : 125.5...127.5  
1000 : (123.5...129.5)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 97...105

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1275...1295  
2nd rack travel in: 4.00  
Speed rpm : 1410...1420  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION  
Speed rpm : 360...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 180  
Rack travel mm : 9.20...9.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.10...8.20  
2nd pressure hPa : 435  
Rack travel in m: 11.40...11.80  
3rd pressure hPa : 900  
Rack travel in m: 12.70...12.80

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 124.5...128.5  
1000 s: (122.5...130.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 45.0...47.0  
1000 s: (43.0...49.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1275...1295

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : IHC #1817111C91

Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 6,0 D 99  
 Edition : 30.11.90  
 Replaces : 19.10.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 270

Injection pump  
 Pump designation : PES6MW100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQV300...1300MW50-10  
 Governor no. : 0 420 083 234

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

---

Rack travel in mm : 11.00...11.10

---

Del.quantity cm<sup>3</sup>/ : 7.7...7.9

---

100 s: (7.5...8.1)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 7.8...8.0  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1350  
 travel mm : 8.50...8.70

2nd speed rpm : 1450  
 travel mm : 9.50...9.90

3rd speed rpm : 500  
 travel mm : 2.70...3.30

4th speed rpm : 300  
 travel mm : 1.20...1.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 900  
 Del.quantity : 77.0...79.0  
 1000 : (75.0...81.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.9  
Speed rpm : 300  
Rack travel in mm : 7.80...8.00

CONSTANT REGULATION  
Speed rpm : 330...500

TORQUE CONTROL  
Dimension a mm : 1.30  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 800  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 585  
Rack travel in m: 12.30...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : 340  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 460  
Rack travel in m: 11.20...11.50  
3rd pressure hPa : 500  
Rack travel in m: 12.30...12.40

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 75.5...78.5  
1000 s : (73.0...81.0)  
Spread cm3 : 5.00  
1000 s : (7.0)  
Aneroid pressure h: 900  
Speed rpm : 585  
Del.quantity cm3/ : 68.5...71.5  
1000 s : (66.0...74.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 34.0...36.0  
1000 s : (32.0...38.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s : (75.0...91.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.80...8.00  
Del.quantity cm3/ : 9.0...13.0  
1000 s : (6.5...15.5)  
Spread cm3 : 3.50  
1000 s : (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,1 B 1  
 Edition : 23.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 272  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131-  
 1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQ300/1300MW105-1  
 Governor no. : 0 420 082 048

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 155.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 9.8...10.0  
 100 s : (9.6...10.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s : (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.40...9.80  
 2nd speed rpm : 1360  
 travel mm : 7.20...7.40  
 3rd speed rpm : 550  
 travel mm : 4.20...4.80  
 4th speed rpm : 300  
 travel mm : 1.30...1.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: 105  
 Speed rpm : 1200  
 Rack travel in mm : 14.70...16.30

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del.quantity : 98.0...100.0  
 1000 : (96.0...102.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control Lever  
position degrees: 101...109

Setting point:  
Speed rpm : 1200  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 350  
Rack travel in m: 12.50...12.80  
3rd pressure hPa : 1000  
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 85.0...89.0  
1000 s: (83.0...91.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 75  
 Edition : 16.11.90  
 Replaces : 06.09.90  
 Test oil : ISO-4113

Combination no. : 0 403 476 075

Injection pump  
 Pump designation : PES6MM100/72ORS1130  
 EP type number : 0 413 406 122  
 Governor  
 Governor design. : RSV350...750MWOA336-  
 4  
 Governor no. : 0 420 085 160

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 84.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

MD9

Rack travel in mm : 9.00...12.00  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 12.00...12.10

---

Del. quantity cm<sup>3</sup>/ : 8.0...8.2  
 100 s : (7.8...8.4)

---

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.8...6.8  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s : (0.6...1.5)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 80.0...82.0  
 1000 : (78.0...84.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 74...82

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 11.00

Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 850  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 61...69  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.80...6.80

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.80  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 25...33 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Observe VDT-I-420/120

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 D 74  
 Edition : 16.11.90  
 Replaces : 06.09.90  
 Test oil : ISO-4113

Combination no. : 0 403 476 078

Injection pump  
 Pump designation : PES6MM100/72ORS1129  
 EP type number : 0 413 406 121  
 Governor  
 Governor design. : RSV350...750MWOA336-  
 3  
 Governor no. : 0 420 085 159

Customer-spec. information  
 Customer : DB-NKW

Engine : OM 366 LA

1st version kW : 94.0  
 Rated speed : 1500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del. quantity cm<sup>3</sup>/ : 8.5...8.7  
 100 s: (8.3...8.9)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.8...6.8  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 2.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Del. quantity : 85.0...87.0  
 1000 : (83.0...89.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 74...82

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 11.50

Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 850  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 60...68  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.80...6.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.80  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 25...33 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Observe VDT-I-420/120

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,2 Y  
 Edition : 19.10.90  
 Replaces : 31.07.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 083  
 Injection pump  
 Pump designation : PES6MM100/32ORS1200-1  
 EP type number : 0 413 406 194  
 Governor  
 Governor design. : RSV300...1100MWOA339-1  
 Governor no. : 0 420 085 140

## Customer-spec. information

Customer : MAN  
 Engine : D0826LE52/LUE51  
 1st version kw : 147.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 11.50...11.60  
 Del.quantity cm<sup>3</sup>/ : 12.7...12.9  
 100 s: (12.5...13.1)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 3.6...3.8  
 Del.quantity cm<sup>3</sup>/ : 0.6...1.0  
 100 s: (0.4...1.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1000  
 Del.quantity : 127.0...129.0  
 1000 : (125.0...131.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 96...104

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
1st rack travel in: 10.50  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1380  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 3.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 3.60...3.80

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 600  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 800  
Rack travel in m: 12.00...12.20  
4th speed rpm : 1000  
Rack travel in m: 11.50...11.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.30...9.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : 210  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 570  
Rack travel in m: 11.80...12.10  
3rd pressure hPa : 1000  
Rack travel in m: 12.40...12.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 133.0...136.0  
1000 s: (130.5...138.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 133.0...136.0  
1000 s: (130.5...138.5)  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 125.0...128.0  
1000 s: (122.5...130.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 70.0...72.0  
1000 s: (68.0...74.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.60...3.80  
Del.quantity cm3/ : 6.0...10.0  
1000 s: (4.0...12.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7063  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 X  
 Edition : 14.09.90  
 Replaces : 03.08.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 084  
 Injection pump  
 Pump designation : PES6MW100/32ORS1180-  
 1  
 EP type number : 0 413 406 193  
 Governor  
 Governor design. : RSV300...1100MWOA339  
 -2  
 Governor no. : 0 420 085 141

Customer-spec. information  
 Customer : MAN

Engine : D0826TUE51/130

1st version kW : 96.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 8.50...8.60  
 Del.quantity cm<sup>3</sup>/ : 8.1...8.3  
 100 s : (7.9...8.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.0...4.2  
 Del.quantity cm<sup>3</sup>/ : 0.6...1.0  
 100 s : (0.4...1.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1000  
 Del.quantity : 81.0...83.0  
 1000 : (79.0...85.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 92...100

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 7.50  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1.350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 4.00...4.20

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 8.50...8.60  
2nd speed rpm : 1000  
Rack travel in m: 8.60...8.80  
3rd speed rpm : 800  
Rack travel in m: 9.50...9.60  
4th speed rpm : 600  
Rack travel in m: 9.50...9.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.10...9.20

Measurement

Speed 1/min : 500  
1st pressure hPa : 170  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 1000  
Rack travel in m: 9.50...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1000  
Del.quantity cm3/ : 81.0...83.0  
1000 s: (78.5...86.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 88.5...91.5  
1000 s: (86.0...94.0)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 83.0...86.0  
1000 s: (80.5...88.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 70.0...72.0  
1000 s: (68.0...74.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 7.50  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.00...4.20  
Del.quantity cm3/ : 6.0...10.0  
1000 s: (4.0...12.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7065  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : PEN 6,1 Q  
 Edition : 23.11.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 094  
 Injection pump  
 Pump designation : PES6MW100/320RS1132  
 EP type number : 0 413 406 124  
 Governor  
 Governor design. : RSV300...1050MW4A308  
 -5  
 Governor no. : 0 420 085 155

Customer-spec. information  
 Customer : PENTA

Engine : TD 61 ACE

1st version kw : 120.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 2.90...3.00  
 : (2.85...3.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1000  
 Rack travel in mm : 11.10...11.20  
 Del. quantity cm<sup>3</sup>/ : 9.2...9.4  
 100 s: (9.0...9.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.2  
 Del. quantity cm<sup>3</sup>/ : 1.2...1.6  
 100 s: (0.9...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.20

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Del. quantity : 92.0...94.0  
 1000 : (90.0...96.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 74...82

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 10.10

Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever  
position degrees: 110...118  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (107.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 2,6 a  
 Edition : 26.03.90  
 Replaces : 24.11.89  
 Test oil : ISO-4113

Combination no. : 9 400 083 422

Injection pump  
 Pump designation : PES3A80D320/3RS1264  
 EP type number : 9 400 083 053  
 Governor  
 Governor design. : RSV350...1200A2B627R  
 Governor no. : 9 420 082 194

Customer-spec. information  
 Customer : MWM

Engine : D225-3

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 3

Phasing : 0-120-240  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1200

---

Rack travel in mm : 9.40...9.50

---

Del.quantity cm<sup>3</sup>/ : 5.0...5.1  
 100 s: (4.9...5.3)

---

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.8...1.6)

---

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Del.quantity : 50.5...51.5  
 1000 : (49.0...53.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (4.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 46...54

Testing:  
 1st rack travel in: 8.40

Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 490...550

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.60  
5th speed rpm : 400  
Rack travel in m: 10.60...11.20

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del. quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (8.0...16.0)  
Spread cm<sup>3</sup> : 2.00  
1000 s: (3.50)

Remarks:

:

#### APPLICATION

Navy

M20

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 5,1 a  
 Edition : 26.03.90  
 Replaces : 24.11.89  
 Test oil : ISO-4113

Combination no. : 9 400 083 429

Injection pump  
 Pump designation : PES6A80D320/3RS1261  
 EP type number : 9 400 083 057  
 Governor  
 Governor design. : RSV350...900A7B627R  
 Governor no. : 9 420 082 193

Customer-spec. information  
 Customer : MWM

Engine : D225-6

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.5...1.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm<sup>3</sup> : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 9.20

Speed rpm : 940...945  
2nd rack travel in: 4.00  
Speed rpm : 975...980  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 450...510

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40  
5th speed rpm : 400  
Rack travel in m: 11.40...12.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 940...945

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (5.0...13.0)  
Spread cm<sup>3</sup> : 2.00  
1000 s: (3.50)

Remarks:

:

#### APPLICATION

Generator

M22

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a  
 Edition : 24.10.90  
 Replaces : 3.7.90  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 449  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

## TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.30...10.40

Del.quantity cm<sup>3</sup>/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.4...2.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 90.0...92.0

1000 : (88.0...94.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 9.30

Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 495...555

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 500  
Rack travel in m: 10.30...10.50  
5th speed rpm : 400  
Rack travel in m: 10.70...11.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...77.0  
1000 s: (71.5...79.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90

Del.quantity cm<sup>3</sup>/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 8,3 a81  
 Edition : 24.10.90  
 Replaces : 26.3.90  
 Test oil : ISO-4113

Combination no. : 9 400 083 449AB

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209

Governer no. : 9 420 083 201

Cust. part no. : 3352892-VERSA001

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kw : 125.1  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del. quantity cm<sup>3</sup>/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Del. quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 82...90

Testing:

1st rack travel in: 9.70  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 530...590

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 10.70...10.90  
5th speed rpm : 400  
Rack travel in m: 11.10...11.60

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del. quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 8,3 a85  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 449AG  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201  
 Cust. part no. : 3353251-VERSA006  
 Customer-spec. information  
 Customer : CUMMINS  
 Engine : 6 CT 8.3  
 1st version kw : 133.2  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1000  
 Rack travel in mm : 10.70...10.80  
 Del. quantity cm<sup>3</sup>/ : 9.6...9.8  
 100 s: (9.4...10.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 400.0  
 Rack travel in mm : 5.1...5.3  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Del. quantity : 96.0...98.0  
 1000 : (94.0...100.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 82...90

Testing:

1st rack travel in: 9.70  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 550...610

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 11.40...11.60  
4th speed rpm : 835  
Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 95.0...98.0  
1000 s: (92.5...100.5)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 103.0...106.0  
1000 s: (100.5...108.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

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Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a80  
 Edition : 24.10.90  
 Replaces : 26.3.90  
 Test oil : ISO-4113

Combination no. : 9 400 083 449AI

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R

Governer no. : 9 420 083 201

Cust. part no. : 3352894-VERSA008

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 139.8  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm<sup>3</sup>/ : 0.8...1.2  
 100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 105.0...107.0  
 1000 : (103.0...109.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 61...69  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 500  
Rack travel in m: 11.10...11.30  
5th speed rpm : 400  
Rack travel in m: 11.50...12.00

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (5.5...14.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a86  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 449BB

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3352898-VERSA011

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

1st version kW : 179.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 11.6...11.8

100 s: (11.4...12.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del. quantity : 116.5...118.5

1000 : (114.5...120.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 86...94

Testing:

1st rack travel in: 11.00  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 565...625

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 500  
Rack travel in m: 12.50...12.70  
4th speed rpm : 800  
Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 112.0...115.0  
1000 s: (109.5...117.5)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 124.5...127.5  
1000 s: (122.0...130.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

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Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a79  
Edition : 24.10.90  
Replaces : 26.3.90  
Test oil : ISO-4113

Combination no. : 9 400 083 449BC

Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV400...1100A2C2209  
R  
Governor no. : 9 420 083 201

Cust. part no. : 3353232-VERSA012

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 154.6  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.40...12.50

Del. quantity cm<sup>3</sup>/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 5.1...5.3  
Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del. quantity : 120.0...122.0

1000 : (118.0...124.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position : degrees: 86...94

Testing:

1st rack travel in: 11.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.60  
5th speed rpm : 400  
Rack travel in m: 12.80...13.30

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a87  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 449B0  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201  
 Cust. part no. : 3354419-VERSA013

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

1st version kW : 155.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.20...11.30

Del. quantity cm<sup>3</sup>/ : 10.6...10.8

100 s: (10.4...11.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.4...2.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del. quantity : 106.0...108.0

1000 : (104.0...110.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 85...93

Testing:  
1st rack travel in: 10.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 575...635

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 950  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 123.0...127.0  
1000 s: (121.0...129.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

N08

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a82  
 Edition : 24.10.90  
 Replaces : 26.3.90  
 Test oil : ISO-4113

Combination no. : 9 400 083 449CI

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3354421-VERSA028

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 154.6  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 11.70...11.80

---

Del. quantity cm<sup>3</sup>/ : 11.5...11.7  
 100 s: (11.3...11.9)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

---

2nd speed rpm : 400.0  
 Rack travel in mm : 5.2...5.4  
 Del. quantity cm<sup>3</sup>/ : 1.1...1.5  
 100 s: (0.8...1.7)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del. quantity : 115.0...117.0  
 1000 : (113.0...119.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 85...93

Testing:

1st rack travel in: 10.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 500  
Rack travel in m: 11.70...11.90  
5th speed rpm : 400  
Rack travel in m: 12.10...12.60

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 a88  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 449CJ

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3354437-VERSA029

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

1st version kW : 132.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1250

Del.quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 90...98

Testing:

1st rack travel in: 9.40  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 485...545

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 10.40...10.60  
5th speed rpm : 400  
Rack travel in m: 10.80...11.30

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 8,3 a89  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 449DB

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3354685-VERSA031

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

1st version kW : 129.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1100

---

Rack travel in mm : 10.10...10.20

---

Del.quantity cm<sup>3</sup>/ : 8.7...8.9  
 100 s: (8.5...9.1)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

---

2nd speed rpm : 400.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 1.4...1.8  
 100 s: (1.1...2.0)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Del.quantity : 87.0...89.0  
 1000 : (85.0...91.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 85...93

Testing:  
1st rack travel in: 9.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 485...545

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 500  
Rack travel in m: 10.10...10.30  
5th speed rpm : 400  
Rack travel in m: 10.50...11.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 71.5...74.5  
1000 s: (69.0...77.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 a90  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 449DC

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3354686-VERSA032

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CTA - 8.3 L

1st version kW : 148.4  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Del.quantity : 96.5...98.5

1000 : (94.5...100.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 85...93

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.2

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 490...550

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 500  
Rack travel in m: 10.80...11.00  
5th speed rpm : 400  
Rack travel in m: 11.20...11.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 81.0...84.0  
1000 s: (78.5...86.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a91  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 450AH  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV375...1150A2C2210  
 R  
 Governor no. : 9 420 083 202  
 Cust. part no. : 3352889-VERSA007

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 C 8.3 L

1st version kW : 105.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 87.5...99.5

1000 : (85.5...91.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 94...102

Testing:

1st rack travel in: 9.40  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1330...1360  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 5.2

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 375  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 475...535

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 10.40...10.60  
5th speed rpm : 400  
Rack travel in m: 10.80...11.30

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 b12  
 Edition : 24.10.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 452CF  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -2  
 EP type number : 9 410 230 028  
 Governor  
 Governor design. : RQV350...1250AB1225R  
 Governor no. : 9 420 080 224

Cust. part no. : 3353986-VERSA025

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

1st version kW : 145.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1150

Rack travel in mm : 11.30...11.40

Del. quantity cm<sup>3</sup>/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1265

travel mm : 8.50...8.60

2nd speed rpm : 900

travel mm : 5.60...6.00

3rd speed rpm : 500

travel mm : 3.80...4.20

4th speed rpm : 350

travel mm : 1.60...2.50

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
Speed rpm : 1150  
Del.quantity : 105.5...107.5  
1000 : (103.5...109.5)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 10.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 67...75

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 390...460

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 750  
Rack travel in m: 12.00...12.10  
4th speed rpm : 950  
Rack travel in m: 11.50...11.80

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 114.0...117.0  
1000 s: (111.5...119.5)

#### BREAKAWAY

N20

1st version  
1mm rack travel less than  
full load rack tr: 10.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 168.0...182.0  
1000 s: (165.0...185.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MWM 5,9 c  
 Edition : 26.03.90  
 Replaces : 4.85  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 239  
 Injection pump  
 Pump designation : PES6A90D32ORS2701  
 EP type number : 9 400 083 094  
 Governor  
 Governor design. : RSV350...1150A2B2097  
 -1  
 Governor no. : 9 420 083 197

Customer-spec. information  
 Customer : MWM

Engine : TD229-6

1st version kW : 106.7  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 046  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75  
 : (2.60...2.70)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

**BASIC SETTING**

1st speed rpm : 1150  
 Rack travel in mm : 10.80...10.90  
 Del.quantity cm<sup>3</sup>/ : 8.1...8.2  
 100 s : (7.9...8.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 0.8...1.2  
 100 s : (0.6...1.4)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1150  
 Del.quantity : 81.0...82.0  
 1000 : (79.0...84.0)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 93...101

Testing:

1st rack travel in: 9.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 540...600

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.30  
3rd speed rpm : 700  
Rack travel in m: 11.20...11.30  
4th speed rpm : 950  
Rack travel in m: 11.00...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.5...76.5  
1000 s: (72.0...79.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (74.5...81.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (6.0...14.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

: VALMET

APPLICATION

Tractor (tractor engines)

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MWM 2,9 a  
 Edition : 26.03.90  
 Replaces : 4.85  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 241  
 Injection pump  
 Pump designation : PES3A90D32ORS2703  
 EP type number : 9 400 083 096  
 Governor  
 Governor design. : RSV350...1150A2B2129  
 -4R  
 Governor no. : 9 420 083 193

Customer-spec. information  
 Customer : MWM

Engine : D 229-3

1st version kW : 42.7  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75  
 : (2.60...2.80)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

**BASIC SETTING**

1st speed rpm : 1150

Rack travel in mm : 8.50...8.60

Del.quantity cm<sup>3</sup>/ : 5.8...5.9

100 s: (5.6...6.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1150

Del.quantity : 58.0...59.0

1000 : (56.0...61.0)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

**RATED SPEED**

1st version

Control Lever  
position degrees: 93...101

Remarks: : VALMET

Testing:  
1st rack travel in: 7.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control Lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 545...605

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 8.50...8.60  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.50  
4th speed rpm : 800  
Rack travel in m: 8.90...9.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 54.0...56.0  
1000 s: (51.5...58.5)  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 60.5...62.5  
1000 s: (58.0...65.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 7.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

N24

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 5,7 n 25  
 Edition : 26.03.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 247  
 Injection pump  
 Pump designation : PES6A90D410RS2293  
 EP type number : 0 410 896 031  
 Governor  
 Governor design. : RQV400...1400AB1214L  
 Governor no. : 9 420 080 206

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 352 A

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 003  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 2.20...2.30  
 : (2.15...2.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1400  
 Rack travel in mm : 11.20...11.30  
 Del. quantity cm<sup>3</sup>/ : 7.5...7.6  
 100 s: (7.3...7.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)  
 2nd speed rpm : 400.0  
 Rack travel in mm : 6.9...7.1  
 Del. quantity cm<sup>3</sup>/ : 1.1...1.5  
 100 s: (0.9...1.7)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1460  
 travel mm : 8.40...8.60  
 2nd speed rpm : 950  
 travel mm : 5.20...5.50  
 3rd speed rpm : 775  
 travel mm : 4.10...4.60  
 4th speed rpm : 550  
 travel mm : 2.70...3.00  
 5th speed rpm : 300  
 travel mm : 0.70...1.20

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1420  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1400  
 Aneroid pressure h: 200  
 Del. quantity : 75.5...76.5  
 1000 : (73.5...78.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 10.20  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1560...1590  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 400  
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION  
Speed rpm : 350...475

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 11.20...11.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 115  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 90  
Rack travel in m: 10.70...10.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 200  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 58.5...60.5  
1000 s: (56.0...63.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 51.0...54.0  
1000 s: (49.5...56.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 70.0...80.0  
1000 s: (67.0...83.0)  
Rack travel in mm : 13.80...14.20

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.90...7.10  
Del.quantity cm<sup>3</sup>/ : 11.5...15.5  
1000 s: (9.5...17.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 3,9 a 1
Edition : 26.03.90
Replaces : 3.86
Test oil : ISO-4113
Combination no. : 9 400 085 268
Injection pump
Pump designation : PES4A90D320RS2702
EP type number : 9 400 083 095
Governor
Governor design. : RSV350...1150A2B2129
-7R
Governor no. : 9 420 083 212

Customer-spec. information
Customer : MWM

Engine : TD 229 EC-4
1st version kw : 66.2
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 012
Inlet press., bar : 1.50
Test nozzle holder
assembly : 0 681 343 009
Opening
pressure, bar : 172...175
Test lines : 1 680 750 003
Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75
: (2.60...2.80)

Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
& maximum rack tra: 21.00
Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150
Rack travel in mm : 10.30...10.40
Del. quantity cm3/ : 7.7...7.8
100 s: (7.5...8.0)
Spread cm3 : 0.3
100 s: (0.5)

2nd speed rpm : 350.0
Rack travel in mm : 5.5...5.7
Del. quantity cm3/ : 1.1...1.5
100 s: (0.9...1.7)
Spread cm3 : 0.2
100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...1.00

Governor spring pre-tension
Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1150
Del. quantity : 77.5...78.5
1000 : (75.5...80.5)
Spread cm3 : 3.00
1000 : (5.00)

RATED SPEED

1st version

Control lever  
position degrees: 94...102

Testing:  
1st rack travel in: 9.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 545...605

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 500  
Rack travel in m: 10.80...10.90  
4th speed rpm : 700  
Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 70.0...72.0  
1000 s: (67.5...74.5)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 71.5...73.5  
1000 s: (69.0...76.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks: : VALMET